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ABSTRACT

This study is one of three designed to evaluate the effectiveness of the Unified Science and Mathematics for Elementary Schools (USMES) program. The team study examined the resource team program and the factors that influenced how effective selected teams were in disseminating and implementing USMES in their areas. This report begins with a discussion of the goals of the study, a description of the resource team program itself, and a summary of the methods used to gather information about the teams. Part two consists of case studies of the fifteen teams, with emphasis on the factors influencing their growth and survival. Part three discusses the major issues that emerge across teams. Part four looks at how USMES is implemented by team-trained teachers. (Author/BB)

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USMES Team Study

Using Resource Teams to Disseminate and Implement USMES

SE 026 363

UNIFIED SCIENCES AND MATHEMATICS FOR ELEMENTARY SCHOOLS:
Mathematics and the Natural, Social, and Communication Sciences
in Real Problem Solving

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This study was designed and administered by the USMES research staff:

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Each made substantial contributions, too numerous to mention, to this study at the same time they were conducting studies on the effects of USMES on students and schools. In particular, Carolyn Arbetter and Daniel Cooper designed the instruments for this study; Felicia Weitzel compiled the information already on file; Nancy Weiner handled travel arrangements, budgets, and liaison with the teams; Phyllis Gentile entered a wealth of information into computer files.

George H. Stalker was the principal author of the report and had major responsibility for the analysis and interpretation of the data. Thomas L. Brown, USMES Associate Director for Utilization Studies, contributed a perspective that was instrumental in shaping the form of the report. The on-site investigators were Earle L. Lomon, USMES Project Director, Thomas L. Brown, and Charles D. Donahoe, Coordinator for Design Lab and Informational Services; they gracefully stepped out of their other roles to carry out the variety of tasks associated with the site visits and to offer their insights into the workings of USMES resource teams. The design of the study was based in part on earlier plans by Earle Lomon, Thomas Brown, and James Corum. Anne Glickman, who did the editing, and John W. Saalfield, who did the graphics, have our special thanks for overseeing the production of the report. Angela Daskalos quickly and carefully transcribed a great deal of the text. Martha Allegro and Susannah Nickerson ably handled the typing, and Patricia Scott, the proofreading.

Finally, we salute the leaders and members of the fifteen teams whose experiences form the substance of this report. Whatever successes and setbacks they may have had, in their independence, diversity, and stamina they represent the strength of American education. Their cooperation throughout the year's research is most gratefully acknowledged.

Carolyn Clinton Arbetter
29 July 1977

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DESCRIPTION OF THE STUDY

Introduction

The USMES Project conducted three studies in 1976-77 to learn more about USMES students, schools, and resource teams. The Team Study examined the USMES resource team program and the factors that influenced how effective selected teams were in disseminating and implementing USMES in their areas.

The general strategy of the Team Study was to gather information on the goals, strategies, and activities of fifteen USMES resource teams throughout the nation. Information on file in correspondence and reports from previous years was supplemented with data from interviews and questionnaires administered during site visits in 1976-77 by USMES staff members. A questionnaire was also mailed to teachers trained by the teams.

This report begins with a discussion of the goals of the study, a description of the resource team program itself, and a summary of the methods used to gather information about the teams. Part Two consists of case studies of the fifteen teams, with emphasis on the factors influencing their growth and survival. Part Three discusses the major issues that emerge across teams. Part Four looks at how USMES is implemented by team-trained teachers. The Appendix includes copies of instruments used as well as more detailed information on the teams studied. The report is intended for use by funders and educators interested in dissemination and implementation of USMES and similar innovative programs.

Goals of the Team Study

The Team Study focused on these key questions:

- How effective have different types of teams been in disseminating and implementing USMES?
    - How many people have they informed about USMES?
    - How many teachers have they trained?

- How many of those trained have used USMES in the classroom?

- What factors have influenced the teams' effectiveness?

  - How are the teams structured?

  - What dissemination and implementation strategies do they use?

  - How do they fit into the local school systems' mode of operating?

The Resource Team Program

Unified Sciences and Mathematics for Elementary Schools (USMES) project was formed in response to the recommendations of the 1967 Cambridge Conference on the Correlation of Science and Mathematics in the Schools. Since its inception in 1970, USMES has been funded by the National Science Foundation to develop and carry out field trials of interdisciplinary units centered on long-range investigations of real and practical problems (or "challenges") taken from the local school or community environment.

The project's major dissemination and implementation effort involved training resource personnel or resource teams from school districts throughout the nation so that they could go back and both inform school people about USMES and train teachers to use USMES in the classroom.* A two-week resource personnel workshop was held in East Lansing, Michigan from June 25 to July 6, 1973. The purpose was to train resource people from a number of different geographic locations in the use and philosophy of USMES and in teacher-training methods. Teams of teachers, administrators, specialists, and--in some cases--university personnel from 17 school districts in five states participated in this workshop.

In 1974, the implementation effort included two resource team workshops; the team concept was given more emphasis. The first workshop was conducted in Arlington, Massachusetts from April 15 to April 21, with participants from 17 school districts in ten states. The second workshop was conducted in Santa Cruz, California from June 24 to July 5, with participants from 18 school districts in ten states. One representative from each team trained in the Spring also attended the second week of the summer workshop for Design Lab Coordinator training. The two workshops were also preceded by short planning conferences attended by district representatives. In addition to learning about USMES and teacher-training methods at the workshop, participants took part in daily team meetings to discuss team strategies in their approach to the implementation of USMES in their districts.

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*In this report "dissemination" is used to mean the process of informing people about USMES and "implementation" the process of causing USMES to be used in classrooms.

In 1975, effort was directed toward training regional teams rather than district teams. A regional resource team workshop was held in St. Louis, Missouri from June 30 to July 11, 1975. Participants in the workshop represented 25 regions in 18 states. In the regional model, multiple school districts, through the resource team members and other involved administrators, shared responsibility with a state education agency or university for implementation and dissemination throughout a region. The agency or university provided liaison, instructional staff, and opportunities for regional dissemination, while the districts supplied resource people with experience in using USMES, visible models of USMES classes, and administrative support at the school and district level.

With the shift in emphasis from district to regional teams, existing teams were joined under a regional team if they formed logical and viable components. Existing teams did not participate in the team training of 1975, however; only representatives from new components or wholly new regional teams attended.

In total, the USMES project conducted four resource team workshops for representatives from 90 school districts. With consolidation of district teams into regional teams, and with some natural attrition, there were, by the beginning of 1976-77, 46 USMES resource teams in 28 states and the District of Columbia. Of these, 15 were selected for examination in the Team Study.

Selecting Teams for the Study

The 15 teams in this study were selected to meet the following criteria:

- There should be a reasonable representation of the various parts of the United States (East, South, Middle West, and West).
- There should be a maximum of variety among the teams chosen in terms of team "model" (discussed below), team size, socio-economic class served, and location (rural, suburban, etc.).
- There should be already available a reasonable corpus of correspondence and records pertaining to each of the teams chosen.
- The teams chosen should express their willingness to participate in the study and cooperate with the investigators.
- The teams chosen should be relatively active, insofar as this could be judged from reports accessible to us.

Teams selected in this way were not always the best, or indeed the most active, teams. Some (two or three) are in doubt about their survival next year. One team maintains that it is continuing this year only to allow us to complete this study. Our interest in examining various types of outcomes has brought a number of teams specially to our attention *because* they have failed in an interesting way, or have undergone some (to us) questionable development in order to survive.

Team Models Represented in the Study

As noted, one of the concerns that guided us in selecting the teams to be studied was the model of each team. A model is defined not only by the two-way conceptual distinction between single district and regional (multiple district) teams, but also by such factors as the involvement of a university and/or state education agency (or other "intermediate" agency). The following table shows the models represented in this study.

Model	*Team No.*
Single District + University	3, 7, 9, 10, 12
Single District	2, 5, 8, 13
Multiple Distirct + University	4, 14, 15
Multiple District + Intermediate Agency + University	1, 6
Multiple District + University Lab School	11

Information Gathering Procedures

Information on the 15 teams that was on file in the form of correspondence and reports from previous years was compiled into team dossiers. (A sample dossier form is included in the Appendix.) In particular, each dossier contained data on:

- Team structure (Members' roles, institutional affiliation, and USMES training)
- Team dissemination and implementation activities (dates; number, roles, affiliation of participants; purpose; agenda; costs/funding source)

Available information was verified and supplemented during site visits to the 15 team locations. Three senior members of the USMES project staff made the visits (one investigator per site); in addition to checking information included in the dossier, they conducted interviews and administered questionnaires to the team during their stay.

The three staff members had all worked closely with the resource team program, and brought to the task a fund of knowledge about USMES resource teams. This enabled them to conduct in-depth, semistructured interviews, branching off from the list of structured questions to explore relevant issues in more detail. While this approach is susceptible to personal bias, it permitted probing to examine underlying factors and relationships too complex or subtle to be cued in the structured questions. Since the information sought did not fit readily into a structured inquiry, it was decided that the use of investigators who were knowledgable about USMES and the teams was preferable to using naive interviewers. To offset subjective bias, the investigators underwent a training session in conducting the interviews and also administered written questionnaires to the teams during their visits.

The interviews were conducted with the team leader individually and with the team as a group, including the leader). For some teams, leadership was shared or had been transferred; in those cases, more than one individual was interviewed privately. The same structured questions were asked in both the individual and the group interviews. (The interview protocol is included in the Appendix.) Topics covered included:

- Team structure--present/past/future
- Team goals--present/past/future
- Team strategies--present/past/future
- Supports and constraints--human and financial
- Team effectiveness
- Effects of team
- Personal satisfaction

The investigators recorded the responses in writing. Their records were transcribed and then sorted by topic and question as well as by team before being analyzed.

During the group interview, team members were asked to fill out a questionnaire to assess team attitudes.* The team questionnaire, which appears in full in the Appendix, consisted of twelve items covering attitudes toward USMES, toward the team's dissemination and implementation activities, and toward their experience as team members. The results were tallied by team; the way in which they were used are discussed in the introduction to Part Two.

Team members also filled out a decision-making matrix at the time of the interview.** The matrix, which is shown in full in the Appendix, was used to generate a graphic representation of who was perceived to have major responsibility for key processes in implementing programs in the local school district(s). Team members were asked to fill out a matrix for USMES and one for another, "successful" program in the district. Members first did the matrices individually and then reached consensus on who the prime movers were for the key governing processes. Possible choices for prime movers included:

- School board
- Central administration
- Curriculum specialists
- Building principals
- Classroom teachers
- Parents

Space was available for other groups to be added. The governing processes were defined as follows:

- Determining goals--establishing or recognizing ultimate objectives.
- Planning--setting for the means to accomplish objectives.
- Programming--determining specific activities.
- Developing and allocating resources--financial and human resources necessary.
- Implementing--carrying out objectives.
- Evaluating--appraising what is done.

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*The questionnaire is adapted from an instrument developed by Edwin White for use in his doctoral research.

**The decision-making matrix is based on work done by Thomas L. Brown as part of his doctoral research.

The decision-making matrices for USMES and the other program were compared in order to determine how well the team's USMES implementation strategy was adapted to the local districts' mode of operating.

As a separate part of the study, a questionnaire was mailed to teachers trained by the 15 teams. The questionnaire asked about their local USMES training, their use of USMES in the classroom, and their perceptions of the most important attributes of USMES as a curriculum. The questionnaire and the results are discussed in detail in Part Four and the Appendix.

THE FIFTEEN TEAMS

INTRODUCTION

The 15 narratives that follow are case studies of the resource teams being investigated.

Numerical information (total number of workshops, teachers trained, etc.,) is effective 1 January, 1977, unless otherwise noted. We have endeavored to verify and complete information already on hand, to supplement figures reported to us in the past with new information from team members, and to discriminate among the implementation activities which have previously been subsumed under the terms "workshop," "informational meeting," "seminar," and "course." However, we cannot guarantee that the numbers are completely accurate. The fact that nearly every team we have studied is unique in structure, as well as in its implementation resources and needs, and has engaged in different genres of implementation activity, has made compilation difficult. Furthermore, funds and personnel necessary to elicit complete reports from the field were not available early in the life of the project.

The method by which the statistics in this report have been compiled has surely failed to disclose some of the implementation activities that have taken place. Thus, if our records show one team to have trained 100 teachers in workshops, and another have trained 200, we cannot assume, even provisionally, that the second team has been twice as effective in fostering classroom implementations of USMES. It would be easy to carry out an evaluation based on just such assumptions (refined, of course, using various measures of the effectiveness of the training in the various locales), but there is simply too much variation in the kind of activity carried out, and too much uncertainty in our records and the records of the resource teams themselves, to justify such a procedure.

Our primary purpose in this section is not to judge the success of each implementation or each team with respect to the others. It is to examine which types of developments can succeed and what deteriorative processes can affect the health of a resource team.

This section is complementary to Part Three, where much of the same information about the fifteen subject teams is found, but organized by issue rather than team.

Implementation Activities

Nevertheless, team implementation activities, so far as we have been able to measure them, are a natural and interesting measure of team effectiveness and team emphasis. The typical format for our reporting of team activities is shown below. This table gives total figures for all the teams in the study, but it is in the same format as the individual tables showing single-team activities that appear in the team narratives.

Summary of Implementation Activities, All Teams Studied

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	223	5581	14.
Workshops	66	1951	5.

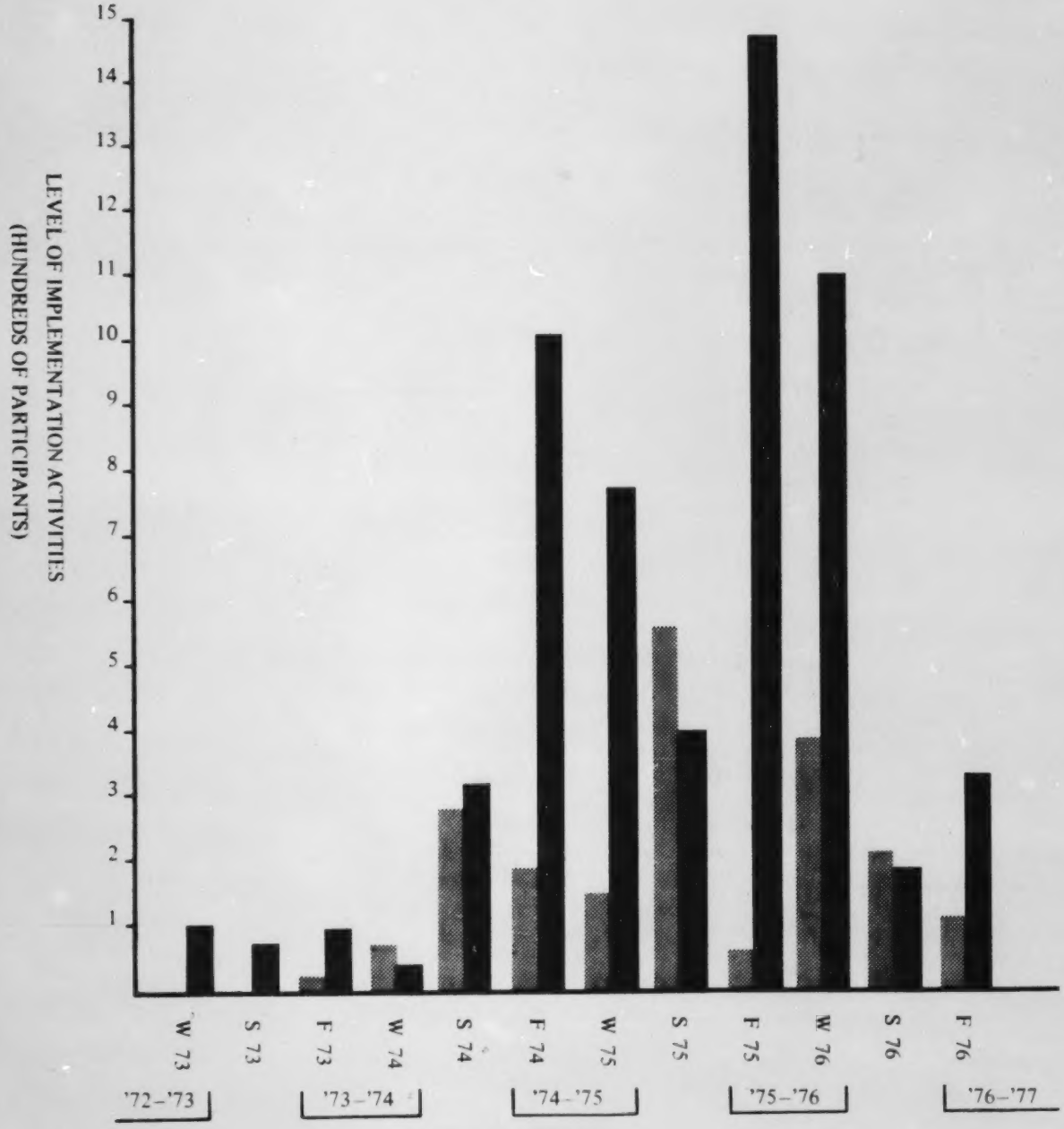
The value labelled "Indiv. Reached/Member-Yr" (individuals reached per nationally-trained team member per year) is of considerable interest to us. It gives a rough measure of the annual return on the funder's investment, in terms of individuals reached in the field through the resource team program.

Other statistics of interest, such as individuals reached per nationally-trained team member (which gives a rough measure of total return on the investment), and individuals reached per year (which indicates the strength of a team), appear in the Appendix. Occasionally these statistics also appear in a narrative, but this is rare.

To give the reader a time-oriented picture of the activities of each team, a histogram display of the individuals reached by each team throughout its history follows each team narrative. The diagram on page 12, shows the format of the individual team histogram, but gives the total activity of the 15 teams.

DISPLAY OF IMPLEMENTATION ACTIVITIES, ALL TEAMS

FIGURE 2.0.8



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

Detailed information on the number and kind of implementation activities for each team, broken down by times conducted, appear in the Appendix.

The Team Questionnaire

The 15 teams were administered a questionnaire (full text appears in the Appendix) to assess team attitudes. The questionnaire consisted of 12 items, and provided an ordered range of five responses: Strongly Agree, Mildly Agree, Can't Decide, Mildly Disagree, and Strongly Disagree. The questions are shown in the following table, along with percentages of individuals responding in each category, among all the individuals queried in the study (n=88).

TEAM QUESTIONNAIRE

Total Percentages for Each Response, All Individuals Queried

		Strongly Agree	*Mildly Agree*	*Can't Decide*	*Mildly Disagree*	*Strongly Disagree*
1.	The team's dissemination and implementation goals are unrealistic.	2.7%	4.0%	4.0%	37.3%	52.0%
2.	The resource team is an appropriate machanism for disseminating and implementing USMES.	63.2	28.7	1.1	5.7	1.1
3.	There is adequate communication among team members.	37.5	36.4	3.4	15.9	6.8
4.	There is adequate communication between the team and other school personnel.	17.0	34.1	14.7	23.8	10.2
5.	The team isn't able to change its dissemination and implementation strategies to meet the needs of the district(s).	2.5	8.8	13.8	38.8	36.3
6.	The team effectively utilizes the strengths of the members to achieve its goals.	46.5	32.6	1.2	15.1	4.7
7.	The team members don't enjoy working together.	1.1	3.4	2.3	18.2	75.0
8.	The team is able to cope with unanticipated problems with minimum disturbance to team activities.	38.6	38.6	11.4	8.0	3.4
9.	The team effectively utilizes the district resources to disseminate and implement USMES.	26.3	50.0	8.8	12.5	2.5
10.	The team will cease to function next year.	1.3	3.8	21.3	17.5	56.3
11.	The team feels that the USMES approach to teaching and learning is important.	77.9	16.3	2.3	1.2	2.3
12.	The team members derive personal satisfaction from being part of the team.	64.3	28.6	4.8	1.2	1.2
		32.2%	24.1%	7.3%	15.9%	20.5%

(Raw Totals Appear in the Appendix)

Rather than report the team totals in full within the text of each case study, we have reported majority-concurrence items: Questions for which more than half of the respondents agreed on a particular single response, such as "Strongly Agree," or "Mildly Disagree."

The following table gives an example of tabulations of majority-concurrence items. It shows majority-concurrence responses for all individuals tested, regardless of team affiliation.

Majority-Concurrence Items on Team Questionnaire for All Individuals Tested

Item	*Response*
The team's dissemination and implementation goals are unrealistic.	STRONGLY DISAGREE
The resource team is an appropriate mechanism for disseminating and implementing USMES.	STRONGLY AGREE
The team members don't enjoy working together.	STRONGLY DISAGREE
The team effectively utilizes the district resources to disseminate USMES.	MILDLY AGREE
The team will cease to function next year.	STRONGLY DISAGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE
The team members derive personal satisfaction from being part of the team.	STRONGLY AGREE

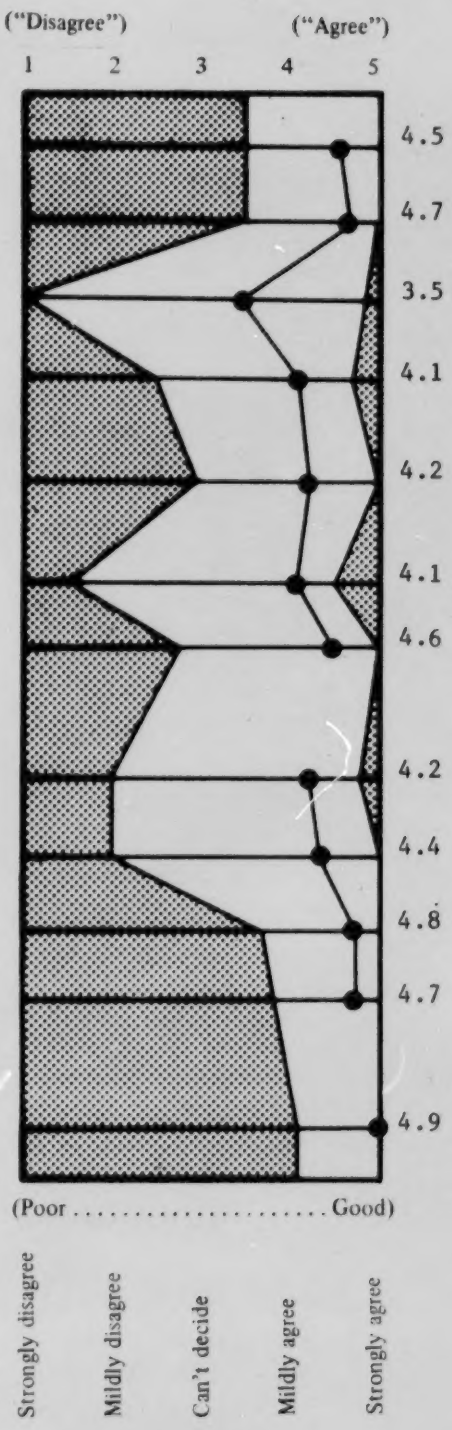
It may also be of interest to the reader to study particular items regardless of majority concurrence by the individuals queried. Accordingly, we have provided a display for each team in which:

- A median response is shown for each item.
- The items have been grouped roughly by topic.
- The sense of some items has been normalized so that positive or favorable responses always appear to the right, negative or unfavorable responses to the left.

The diagram on page 16 shows such a display.

TEAM QUESTIONNAIRE: COMPOSITE

MEDIAN RESPONSES FOR ALL INDIVIDUALS STUDIED *



TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic
2. The resource team is an appropriate mechanism for disseminating and implementing USMES
4. There is adequate communication between the team and other school personnel
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s)
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities
9. The team effectively utilizes the district resources to disseminate and implement USMES
10. The team will [continue] to function next year

WITHIN THE TEAM

3. There is adequate communication among team members
6. The team effectively utilizes the strengths of the members to achieve its goals
7. The team members . . . enjoy working together
12. The team members derive personal satisfaction from being part of the team

THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

*Shading indicates limits of median responses for all the teams in the study

NOTE: Medians computed for these purposes assume interval level measurement at least between adjacent responses.

A sample reading of the median response display suggests that, relative to other teams in the study, the team shown is stronger in its adaptation to its environment, and weaker internally. However, this type of display is based on a very small sample, so we shall be more cautious about drawing conclusions from them than from lists of majority-concurrence items. A display of this type follows each individual narrative in the study, (except for Team 6, for which data are not available).

Decision-Making Matrices

At the time of the team interviews, resource teams were asked to aid the interviewer by filling out a decision-making matrix, showing the levels at which decisions were made in their district(s) pertaining to USMES and to a different, successful program in the district. The form used appears in the Appendix. When the decision-making profile of a particular team is felt to be relevant to some point in the case study narrative, the profile for the team is displayed in the following collapsed form:

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				O		X
PLANNING *(setting forth means to accomplish objectives)*		O				X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*		O	X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*					O	X

All team profiles, displayed in this form, along with cumulative figures for all teams, are supplied in the Appendix.

The Case Studies

The 15 teams presented in the case studies which follow met our criteria for selection extremely well in most cases. They represent all geographic areas of the United States and provide a maximum of variety in terms of team model, size of population, socioeconomic representation, and location (rural, suburban, etc.). Team members participated willingly in all cases, providing the requested written data and participating in interviews. In most but not all cases, the teams were relatively active at the time of the study. Finally, each team has reviewed the reports that appear here for factual accuracy.

RESOURCE TEAM 1: Multiple District + Intermediate Agency + University

Team 1 is not included in this study because it is typical of any large class of USMES teams, but because it is a unique and quite successful adaptation of the resource-team idea to special circumstances.

The team which was formed in 1975, serves a very large school system in a metropolitan area of several million people in the northeastern United States. Nineteen members of the team were trained at the St. Louis ('75) workshop. The performance of the team in implementation activity has probably exceeded that of any of the other teams studied.

Summary of Implementation Activities, Team 1

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	9	271	9.0 (11th of 14)
Workshops	13	433	14.4 (1st of 14)

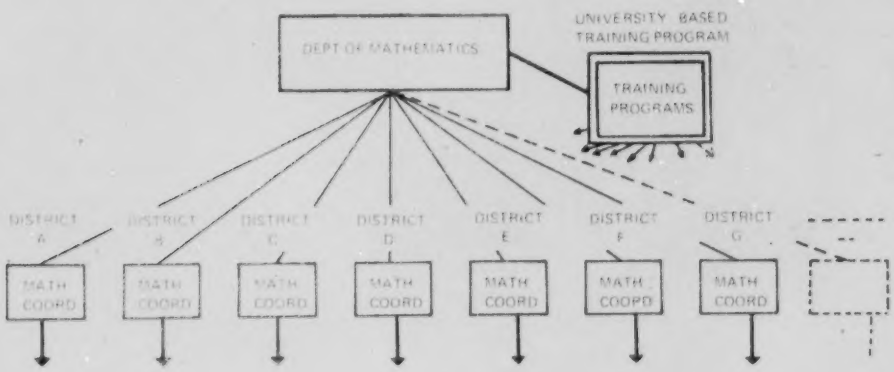
As the reader can see, Team 1 ranks first of all teams studied in individuals reached annually through workshops per nationally trained team member. This represents a good "annual return on investment," at least in terms of individuals reached in the field, and is therefore an important indication of the functional success of Team 1.

History and Structure

USMES was first introduced into the area through a three-week leadership specialist workshop, given at a local college, in which five science curriculum programs, including USMES, were presented to about 60 participants. Subsequently, USMES was instituted by the director of the department of mathematics for the metropolitan area, in order to supplement a Madison Project/Math Lab program that was already operating under his department. Team 1 is the result of a special collaboration between the USMES central staff and this director.

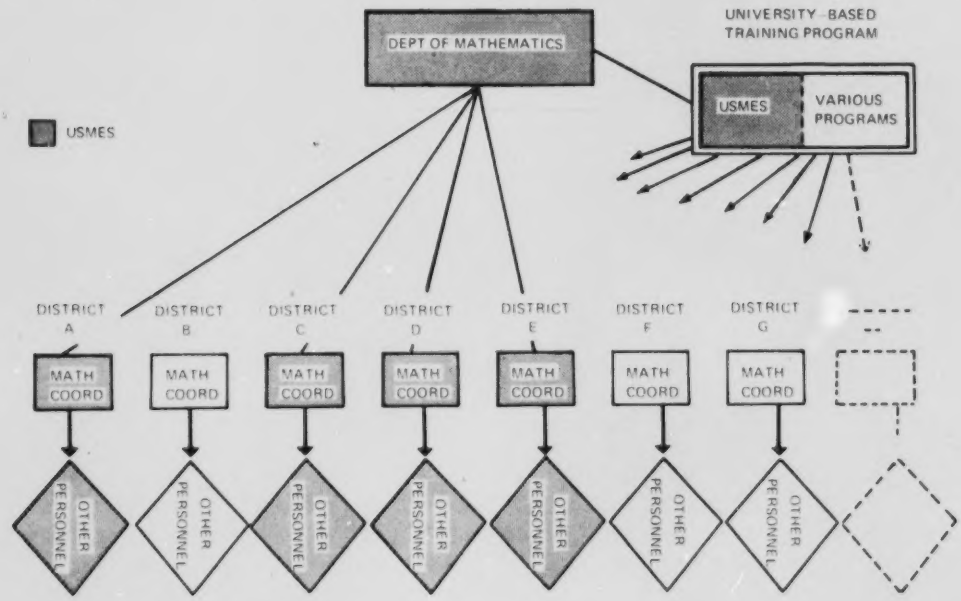
Some of the mechanisms used for dissemination and implementation of USMES were already in place as part of the Madison Project/Math Lab program before USMES was introduced.

The diagram below shows the Madison Project/Math Lab structure (considerably simplified) that was later adapted to include USMES.

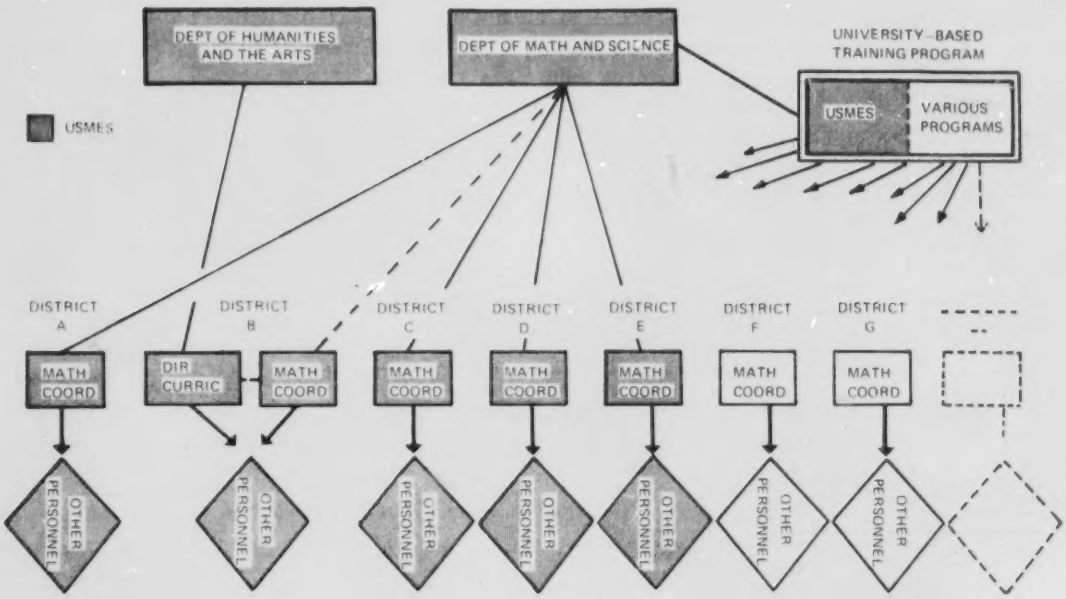


The department worked through mathematics coordinators in various districts and employed a training program physically located at a local university, for which college credit (from another, out-of-state university) was given. However, contact between the department and district personnel was not (as one might suppose from glancing at the simplified figure above) exclusively through math coordinators--there were a number of other channels of contact, including contact through so-called "key teachers" in the districts.

When the department director introduced USMES, he selected four districts. Employing math coordinators and, to some extent, key teachers who were already working with his bureau on the Madison Project/Math Lab programs, he instituted these districts as components of an USMES resource team. A further training component for Team 1 was formed by including USMES training in the university-based Madison Project/Math Lab training program, and arranging for the help of a university faculty member with USMES expertise. The following diagram gives a somewhat simplified picture of Team 1 at this stage.



At a later stage of development, another department became involved with USMES. This entity, the department of humanities and the arts, involved itself through the District B director of curriculum. Previously, District B had been involved only informally in USMES, through presentations sponsored by the department of mathematics. The ensuing team structure which is the present structure, is shown below.



The department of humanities and the arts does not employ any instructors outside its own staff (in contrast to the department of math and science, which continues to provide training through university-based programs).

Once this stage of development was reached, Team 1 suffered two reverses: The director of the department of math and science, a strong supporter of USMES in the city and team leader, retired; and the state in which the implementation sites are located ceased to accept accreditation for teachers from out-of-state institutions such as the one giving credit for the university-based instruction shown in all the figures. Thus, although that institution was willing to seek accreditation in the state that hosts Team 1, it became clear that the team was facing delay, at best, and at worst, cessation, in the work of its university-based training component.

Present Components of the Team

The department of mathematics and science: Originally, this component led the team. Its director was team leader; he coordinated the activities of the team, promoted USMES through the school system, and gave informational presentations. Since his retirement, the position of team leader has fallen to the acting director of the department. This official is not a wholehearted partisan of USMES. He has approached USMES "to see math and science interact," since there is, on the part of the center, "an interest in integrating math and science", however, he is "concerned about loss of time in math or science instruction, because teachers 'go easy' in USMES time."

He believes that "identification with a problem and involvement" are important, but fears that much of USMES is "too far removed from math and science."

Thus, the new team leader is interested in USMES, and sees that a desirable integration of math and science may ensue if it is used. However, he has reservations about USMES, and is not hesitant to voice them. He will choose a middle way, "putting in enough time to keep USMES from disappearing," but not strongly promoting USMES.

This situation seems to point to a major pitfall in "symbiotic" implementation strategies (where USMES and another program team up to their mutual advantage, each supplying something the other lacks). Once a resource team evolves into a hierarchy or system, it is attached to that system and becomes passively vulnerable to changes in personnel within the system. This is particularly true for USMES, because USMES is introduced into a structure most effectively when senior personnel in the structure support the program actively. These individuals attract USMES leadership responsibilities to themselves, and thus to their job roles in the school organization; when they leave, the effect on their team is especially bad.

The board of education's present mandate to the department of math and science appears to be somewhat different from its earlier mandate; it now specifies that the department serve districts only "on request," or "based on expressed needs." If department personnel place a strict interpretation on this mandate, the department may be systematically prevented from taking so strong a position as formerly in promoting USMES among the districts.

The university: This component was first introduced when tuition-charging courses used for Madison Project/Math Lab training were partitioned to include USMES training; it has continued to function in somewhat the same manner throughout its existence. Funding for the USMES segment of the training was secured by partitioning tuition fees to conform with the partitioning in the training.

In general, this arrangement has worked very well for the team. It fits existing patterns of training in the school system; it is easy to implement; it is easy to continue without outside funding. Recently, however, certain problems have arisen. As noted, changing policies of the state in which Team 1 is located have made it impossible to offer credit for courses given under the auspices of out-of-state institutions; it has been necessary to arrange for local credit.

Overall, this component has been outstandingly successful. The activity of one extremely effective, university-based USMES instructor has accounted for much of the training recently done by this component.

The department of humanities and the arts: This component was formed when the director of the department of humanities and the arts became interested in USMES as a staff development tool in meeting a need she perceived for "developing an integrative program."

USMES is perceived by this director as a means for evaluating the hypothesis that "major types of skills and concepts can be developed through giving opportunities for problem solving."

The entire staff of the department was trained in June 1976, at a workshop given by the team's University Component. Two-to-three-days' training was provided for most of the members.

The new component's first implementation activity was a workshop given in September 1976, to teachers from a local school district (District B). It was not very successful, since personnel were not prepared to give a workshop, and participants, many of whom had heard of USMES through the mathematics coordinator of District B, expected training that emphasized science and mathematics. They were somewhat disappointed by the actual presentation, with its emphasis on group dynamics.

The department director now believes that her staff cannot, unassisted, train teachers to use USMES without further preparation, but she is still sympathetic to the program. Our on-site observer believes that the department can function as a successful component if it employs USMES-experienced teachers from the school system as workshop instructors, rather than department personnel. It seems that a strategy such as this is desirable since members of the department of humanities and the arts are, at best, not as familiar with USMES as many teachers in the area, and, at worst, are unsympathetic to USMES.

District A: The District A component now includes about ten teachers (trained at a local workshop funded by District A) who "could staff future workshops." Like the other district components, District A seems to view USMES as a means for moving toward "an integrated curriculum." Neither release time nor money for teacher trainers and follow-up visitors is available, but the teachers involved have worked together well. An ESEA Title IV grant is being sought for a consumer education/USMES program.

District B: District B became involved with USMES in two ways: Informally, through its math coordinator; formally, in a workshop given by the department of humanities and the arts. The effect of the latter contact was not positive overall, but there is still considerable interest in the district (generally in science and mathematics applications), and the district math coordinator is still promoting USMES effectively and correcting negative impressions where they exist.* An ESEA Title IV grant is being sought for a career education/USMES program.

District C: Members were trained at the St. Louis ('75) workshop after hearing of USMES through the department of mathematics. Although members did not carry out extensive dissemination activities for the first year of the component's life, USMES seemed to be used widely among the members themselves, and within the school of one principal who is a member of the resource team. a five-day workshop was financed and held in January and February of 1977. Informal indications are that this workshop was very successful, and has made the component stronger by providing extensive training and setting up Design Labs for a number of sites.

District D: Members were trained at the St. Louis ('75) workshop. After an initially active period (including a course given by a local college during the first year), only two or three teachers continue to use it in the district, and "all further teacher support and new training seems to have been abandoned."

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*An intra-district workshop, given by District B after the close of this study, was quite successful.

District E: It has been difficult to gather any information on USMES activities in District E. It is clear, however, that USMES, unnamed, has been used there for some time.

Present Condition and Prognosis for Team 1

The present state of USMES implementation in the area served by Team 1 is, as we have seen, complex. Team 1 has reached more individuals in workshops per year than any other team in the study (273 individuals per year, as opposed to a study-wide mean of 32 per year, and in contrast to the next-most-prolific team, Team 8, which averaged 124 individuals per year with a team almost three times as large). The team's "annual return on training" figure (individuals trained at workshops per year per national-workshop-trained team member) is also the highest of all teams in the study (14.4, as opposed to the study-wide mean of 5.0). Thus, Team 1 has clearly been extremely successful.

The retirement of the team's original leader, the director of the department of mathematics, has been a blow to the team, and the problems in obtaining college credit for trainees are presently creating future difficulties. However, beginning in Fall 1977, these problems will be solved at least temporarily. The department of curriculum and teaching at a local college is instituting a program of inservice training of local teachers, for which it is offering credit. This program will be coordinated by the original team leader. Thus, it appears that the problems currently hindering the efforts of the team will be alleviated.

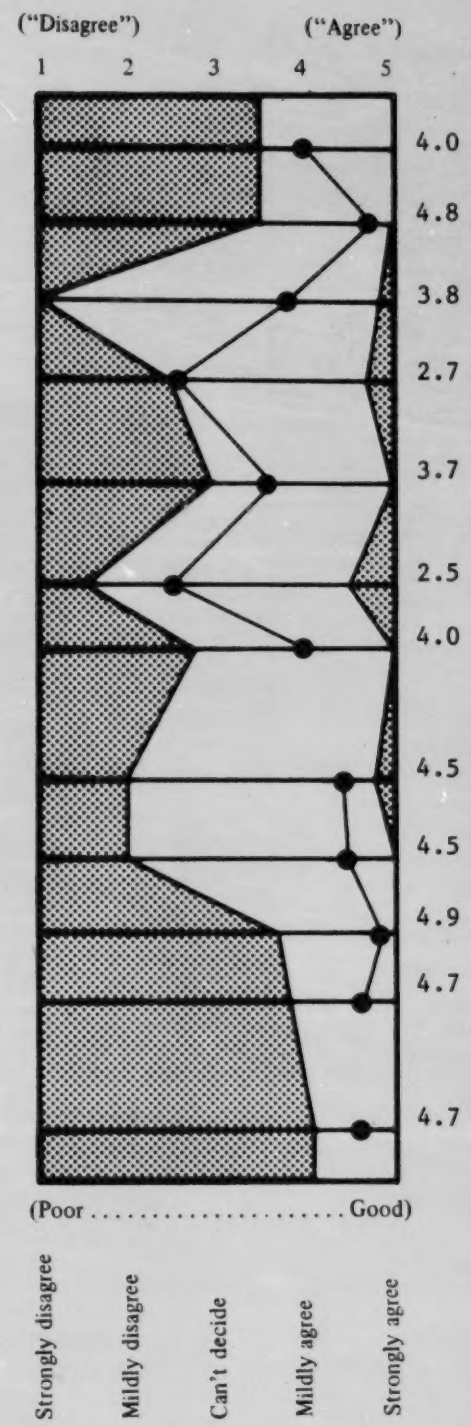
SUMMARY

In terms of implementation activities already carried out, Team 1 is probably the most successful team in the study. The way in which this team has grown within the school system of one of the nation's largest metropolitan areas suggests that team development within existing hierarchies should be tried elsewhere.

On the other hand, since the quality and dedication of team leadership is very much determined by what sorts of individuals hold various positions in the school system at a particular time, the success of the team is not assured by a strong beginning. The fact that the team's original leader, after retiring, has taken a position coordinating inservice teacher training under the auspices of a local college, a position from which he can resume team leadership, is a stroke of good fortune that has saved Team 1 from a potentially embarassing leadership vacuum.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 1



TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic
2. The resource team is an appropriate mechanism for disseminating and implementing USMES
4. There is adequate communication between the team and other school personnel
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s)
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities
9. The team effectively utilizes the district resources to disseminate and implement USMES
10. The team will [continue] to function next year

WITHIN THE TEAM

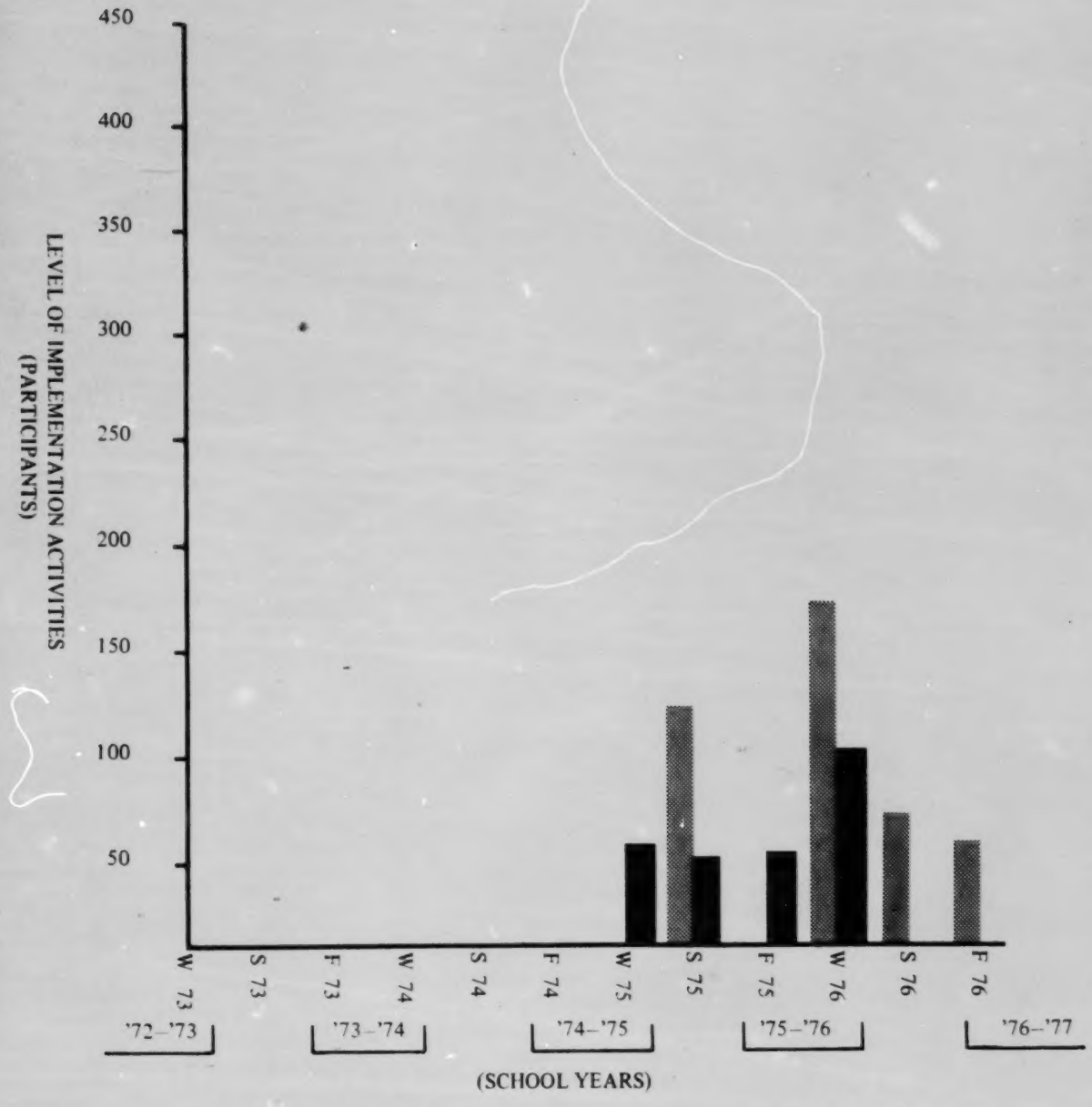
3. There is adequate communication among team members
6. The team effectively utilizes the strengths of the members to achieve its goals
7. The team members . . . enjoy working together
12. The team members derive personal satisfaction from being part of the team

THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 1



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 2: Single District

Resource Team 2 serves a single school district of about 50,000 people in a midwestern suburban area. The population can be described as management-oriented, upper-middle to upper class in socioeconomic status. Racially the population is reported as white, with some Vietnamese, black, Spanish surname, and Native American individuals.

This team has been in existence for some time. Five individuals on the team were trained in 1974 at the Arlington ('74) national workshop; 11 other core members have been trained in other ways. By one account, the total number of individuals now belonging to the team is very large: 48. However, team organization presupposes the existence of a much smaller steering committee, which is central to the operation of USMES in the area.

Team 2 has been successful in carrying out its goals, and is in all respects strong and successful. Responses to the team questionnaire are among the most positive in this study (see p. 34); furthermore, there was a majority concurrence on every item in the questionnaire (12 out of 12), so we suspect these results are rather trustworthy. The only item on which there was less than the most positive response possible was, "There is adequate communication between the team and other school personnel." The majority responded "mildly agree."

Performance in implementation activities is also very good, as the reader can see from the following table.

Summary of Implementation Activities: Team 2

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	9	293	22.0 (5th among 14)*
Workshops	5	136	10.2 (2nd among 14)

*Ranking is based on fourteen teams only, because Team 6 personnel were not trained through the resource team program.

The number of individuals reached in workshops per year per project-trained team member is especially large. Actual implementations seem quite strong. The team's goals have been met -- every building in the target district has classes doing USMES. Although sources of financial support have weakened somewhat, USMES has made quite a successful transition from central to building level in its funding base. It seems a good sign that "all principals include USMES when reporting to long-range planning citizens committee."

Some of the more interesting features of the team are the following.

1. Since the initial goal of reaching all buildings in the district and setting up USMES programs has been met, the team has begun to work on other goals. Some of these are:

   - to interest more teachers in USMES.
   - to become involved with secondary-school real problem solving.
   - to correlate USMES with local career education objectives (a set of options from which district teachers choose items annually).
   - to seek support in using USMES for the "high potential" student.

2. The steering committee, which guided the difficult transition from district-based funding to building-based funding, coordinates efforts to follow up teacher training with individual support and guidance.

3. As student enrollment decreases, efforts are being made to claim former classroom space for Design Labs.

4. USMES units are being used as substitutes for regular three-month mini-courses in the district.

5. Joint budget-making for USMES in all schools is being instituted. (This applies to such things as collectively ordering Tri-Wall, allocating release time, etc.)

6. A number of locally selected instructional materials (such as films that teach skills) are included in the program.

Obvious factors contributing to the team's success appear to be its location (in an affluent school district that gives it support) and its leaders, who are skillful and who believe in USMES. Yet Team 2 has been identified (in the words of our on-site investigator) as

"our only upper-class success" and it is interesting to speculate why this should be. Such speculation is difficult because it is hard to distinguish between causes and symptoms. For example, we might suggest that seeking and obtaining district-level funding the first year was a sound and successful strategy: More sound, for example, than attempting to institute USMES by setting up a single model in one building and hoping it would attract interest and funding at the district level, a strategy many teams adopted. However, it is not clear that district-level funding is really a *strategy* in this case, rather than an outcome of prior strategies and conditions unknown to us. The explanation may simply be that conditions are hospitable to USMES in the area.

Bearing this caution in mind, we nevertheless believe that the following contributed significantly to the success of Team 2.

1. Unlike many teams in this study, Team 2's chief implementation thrust was carried on by personnel who have district-wide authority.

TEAM 2

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				X	O	
PLANNING *(setting forth means to accomplish objectives)*				XO		
PROGRAMMING *(determining specific activities)*				X		O
ALLOCATING RESOURCES *(financial and human resources necessary)*				XO		
IMPLEMENTING *(carrying out objectives)*				X		O
EVALUATING *(appraising what is done)*			O			X

The decision-making structure indicated above seems to be effective. Throughout the study, it appears that USMES proceeds more freely when decision making is carried out by a curriculum coordinator rather than by classroom teachers or by building administrators.

2. The size of the team seems suited to the task: It is neither too small to have broad impact within the school system, nor too large and unwieldy. Although the team itself is large, its steering committee consists only of the initial team (five people) and representatives from each school implementing USMES. The steering committee is organized effectively: It takes advantage of social contacts to disseminate USMES, it coordinates follow-up teacher training, and it has been instrumental in seeing that the team survived potentially dangerous periods (as, for example, when the sources of financial support were changing from the district level to the building level).

3. The team has taken pains to correlate USMES specifically with other district programs and standard curriculum areas. Correlation with district career education objectives has made USMES an official (although optional) part of the district curriculum. Team members have also correlated USMES successfully with math, science, and social studies (especially basic economics education) in the district, which gives substance to the view that USMES is a legitimate approach to teaching in those areas.

4. The district leadership appears to agree with the philosophy underlying the USMES program. Team leaders noted that "USMES was perceived [when instituted] to be consistent with the [current] science and interdisciplinary studies direction of the district, which also believed in the ability of students to solve real problems. The district liked the idea of developing teams, and the philosophy of USMES in teacher training."

5. The district is wealthy, and enrollment is dropping. This means that Design Lab funding has never been the hopeless problem that it has been for many other teams. With a reduced need for classrooms, new space for Design Labs may become available.

SUMMARY

Team 2 is perhaps the most successful single-district team in this study. It has met its original goal (the introduction of USMES into every building in the district) and is working on new goals, such as adding more teachers and expanding the program to include secondary-school implementation.

It is our belief that the success of this team proceeds from favorable local conditions, from the fact that USMES is coordinated at the curriculum coordinator (rather than classroom teacher) level, and from the skillful and energetic work of team members in correlating USMES with district curriculum items and programs having prior support.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 2

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.6
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 5.0
4. There is adequate communication between the team and other school personnel — 4.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.7
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 5.0
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.0
10. The team will [continue] to function next year — 5.0

WITHIN THE TEAM

3. There is adequate communication among team members — 4.0
6. The team effectively utilizes the strengths of the members to achieve its goals — 5.0
7. The team members . . . enjoy working together — 5.0
12. The team members derive personal satisfaction from being part of the team — 5.0

THE USMES PROGRAM

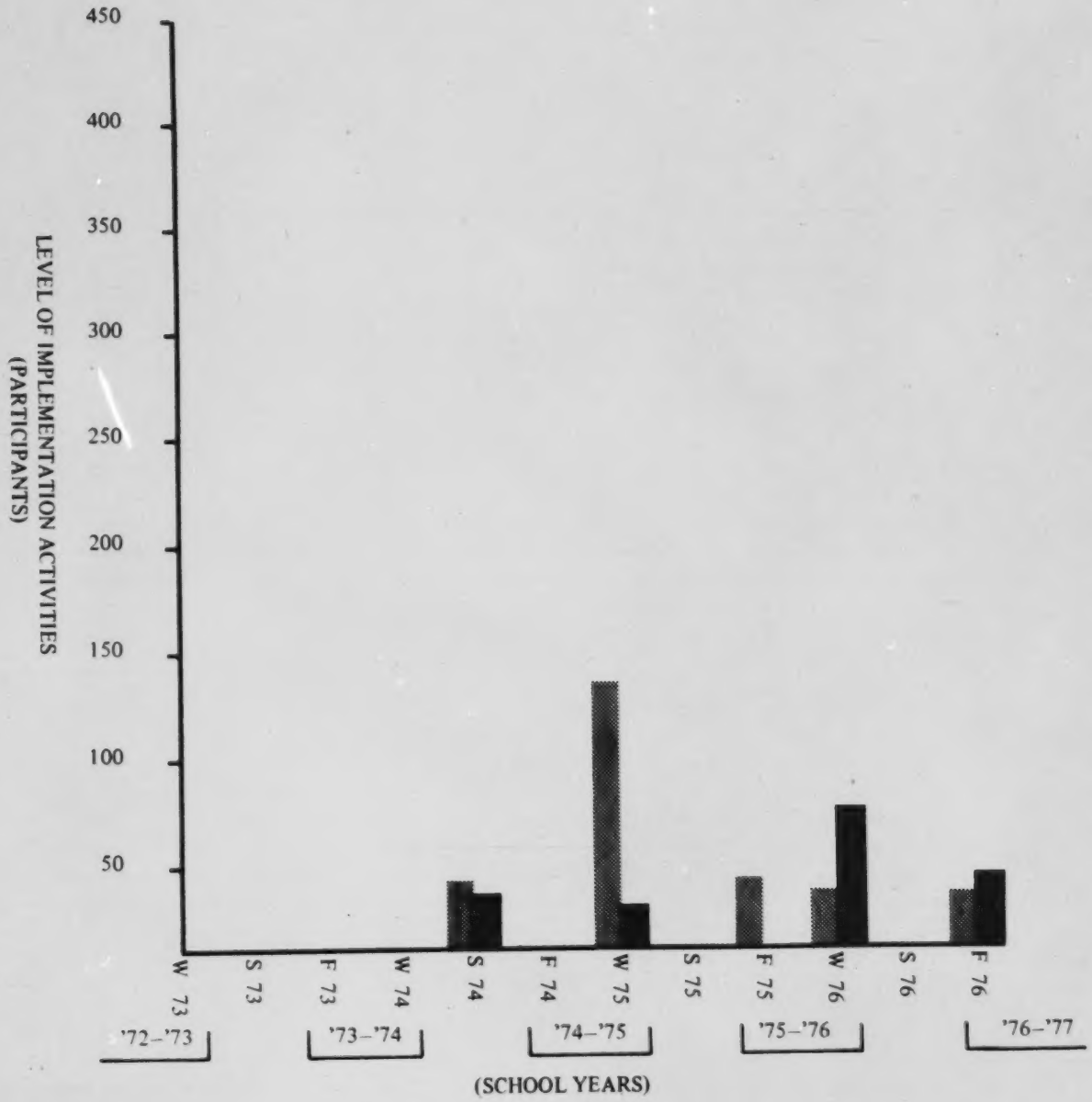
11. The team feels that the USMES approach to teaching and learning is important — 5.0

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 2



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 3: Single District + University

Resource Team 3 is located in an urban area with a population of 300,000, in the middle western part of the United States. Racially, the population is about 20 percent black, 75 percent white, and 5 percent Chicano and Native American.

Nine team members were trained at the Santa Cruz ('74) workshop. Presently, the team numbers more than 50, if one includes all USMES teachers in the area, of whom about six members are very active. The team is being aided by a three-year foundation grant, which pays the salary of a full-time coordinator. The grant entails development of a secondary-school, real-problem-solving program; consequently, USMES has expanded from elementary school sites into junior high schools, and is expected to be implemented in high schools in the near future.

Team 3 was set up initially by a supervisor of curriculum who wished to "make USMES an alternative in elementary schools," but whose chief concern was staff development. This official was able to secure funds with which to foster local USMES programs, and the first year of the team's existence was "very successful." Subsequently, she did not supervise the team so closely, and the absence of her strong leadership was felt: "The team did not do everthing they should have done. They did not use all the money or release time, and did not arrange [to send] representatives to the USMES national convention." Thus, after a strong start, USMES suffered a falling off when the team leader stepped down from active leadership.

A second phase in the history of the team began when the team received a three-year, private foundation grant. Although the grant emphasizes secondary-level implementation, in many ways it promotes the continued implementation and dissemination of USMES at the elementary school level. It is now possible to have a full-time USMES coordinator for the team, a change that not only creates strong team leadership but also facilitates such tasks as follow-up of existing implementations. Furthermore, the presence of a grant and the superstructure of a "project"

make it possible for university personnel already associated with the team to take more active roles that are better integrated with their own career goals. Project administration, project direction, and program evaluation are among the activities in which university personnel are now involved.

While these developments strengthen USMES at present, it is possible that increased emphasis on developing a secondary-school program may ultimately retard the dissemination and implementation of USMES in elementary schools. It is also possible that a diminution of funding at the end of the current grant will find the team hard-pressed to carry out vital implementation and follow-up activities.

Responses to the team questionnaire (p. 40) give an interesting picture of its internal state. Items 3,4,7,and 12 (communication among team members; communication between team and other school personnel; team members' enjoyment in working together; and team members' personal satisfaction) elicit rather weak responses, relative to the other teams in the study. These responses suggest a team that is quite effective but, in contrast to other teams, only moderately pleasant to work on. This may reflect the recent shifts of power that were noted by our outside observer: Power seems to have shifted from the curriculum supervisor to individual teachers, then, with the start of the foundation grant, to a USMES coordinator and project/grant administrators.

Other signs are quite positive. The organizational structure supporting USMES appears well adapted to the local district, as the following diagram suggests.

TEAM 3

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*			O	X		
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*			O			X
ALLOCATING RESOURCES *(financial and human resources necessary)*		O	X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*		O				X

Funds are made available at the central administration level (where the power to allocate funds in fact resides), and overall program goals for the district are decided by the curriculum coordinator. Classroom teachers, who have the most complete knowledge of the program as it develops locally, and whose positive support of the program is essential for its survival, have control over program implementation. One problem has been a negative reaction from some teachers "to imposition of programs from central office," but this opposition has been overcome more or less by "working on a school-by-school basis."

The implementation/dissemination record of the team is very good.

Summary of Implementation Activities, Team 3

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	57	912 (1st among 14)	35.8 (3rd among 14)
Workshops	3	157	6.2 (6th among 14)

In general, Team 3 seems to respond to its problems in an effective manner. Budget cuts are a problem for the team, as for other teams. However, the team's success in securing foundation funding has offset this, at least for the moment. Large class size is cited as a problem, yet proposed measures for ameliorating the problem--use of parent volunteers, offering several challenges in each class--represent a reasonable attempt to deal with this difficulty. A concern expressed by district personnel, that the program might become too diffuse, is being addressed. The team is emphasizing "skills sessions," and is showing empirically the effectiveness of USMES in connection with economics education (Ellis and Glenn, 1977).

SUMMARY

Team 3 got off to a strong start because it was introduced by a district-level official to meet a perceived need in the district: Staff development. When this official withdrew from active leadership, the team suffered a leadership vacuum.

More recently, the team has been strengthened by a three-year grant, which emphasizes the development of a secondary-level, real-problem-solving program. Since this grant has provided team leadership in

the form of a full-time coordinator and project/grant administrators, and has led to the productive study of the program by university personnel, it must be regarded, in the main, as a good development for the team. However, there are potential dangers in such a grant--collapse of the program when grant funding disappears; weakening of the elementary school emphasis by the secondary-level development effort--that may ultimately do the team some harm.

The immediate survival and short-term growth of the team is certain. Long-range prospects appear favorable, but further developments will be required to ensure the continuation of the program.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 3

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 5.0
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.8
4. There is adequate communication between the team and other school personnel — 2.5
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.7
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 3.9
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.0
10. The team will [continue] to function next year — 4.9

WITHIN THE TEAM

3. There is adequate communication among team members — 3.8
6. The team effectively utilizes the strengths of the members to achieve its goals — 3.9
7. The team members . . . enjoy working together — 4.3
12. The team members derive personal satisfaction from being part of the team — 4.0

THE USMES PROGRAM

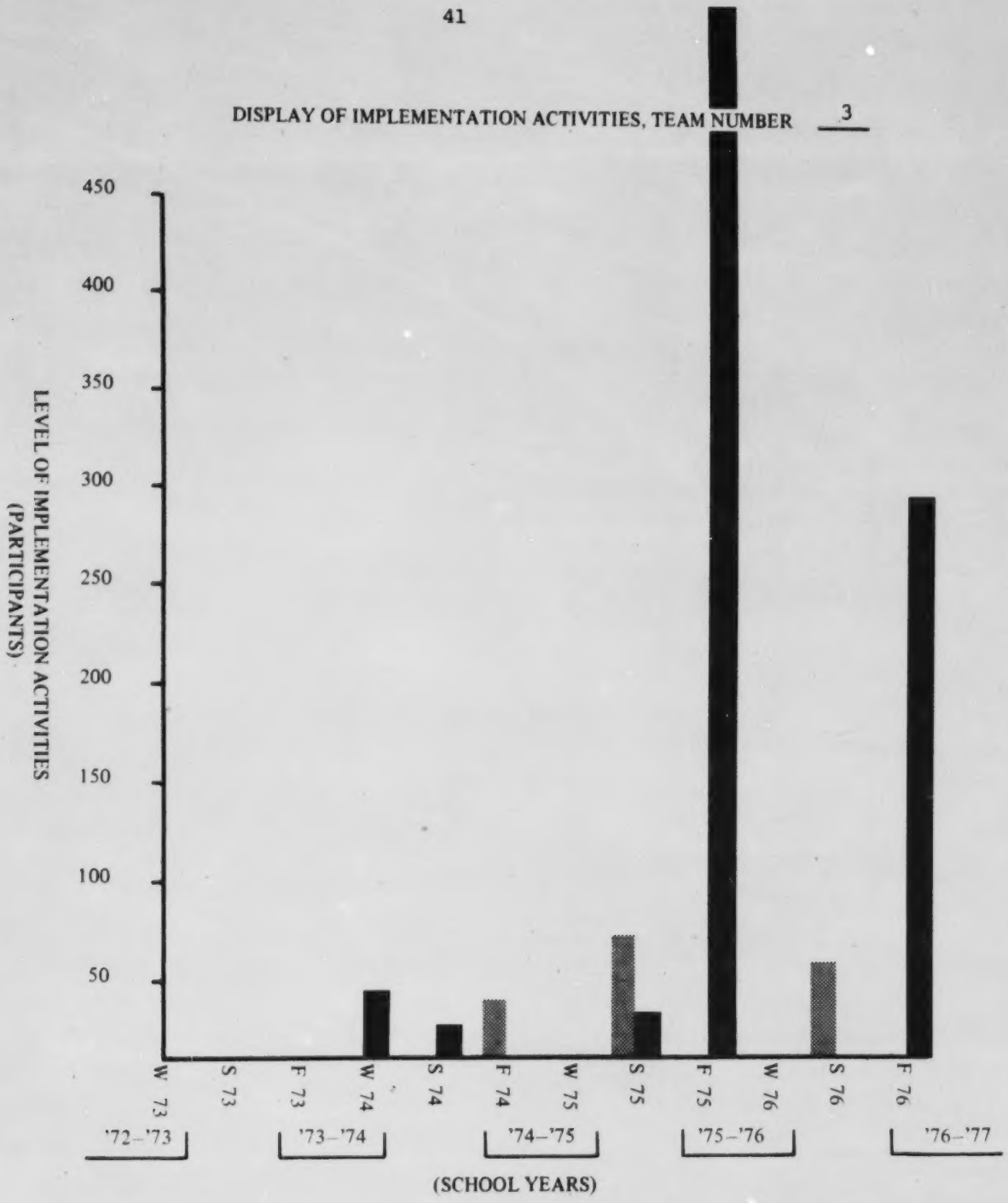
11. The team feels that the USMES approach to teaching and learning is important — 4.9

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 3



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 4: Multiple Districts + University

Team 4 serves a very large metropolitan area, about two million people, and the surrounding rural and suburban territory, which covers four adjacent counties. The team is also involved in a more limited way in other neighboring counties. According to the statements of the three team leaders, all socioeconomic classes, races, and types of community are found within this area.

The history of the team is not simple. It was first conceived as a single district team with university involvement. To start the team, some members attended the East Lansing ('73) workshop. Subsequently, another single district team was conceived, and resource team members were trained at Santa Cruz ('74). Finally, a regional team was instituted through the St. Louis ('75) regional team workshop. The USMES central staff has attempted recently to unify these parts into a single greater-metropolitan structure, but it is doubtful that these efforts have met with success.

Portions of the team have carried out a rather massive and successful implementation and dissemination program in the past. The record is quite good, as the table below indicates.

Summary of Implementation Activities, Team 4

Type of Activity	*No.*	*Indiv. Reached*	*Indivs. Reached/Member-Yr*
Informationals	24	879 (3rd Of 14)	12.3 (10th of 14)
Workshops	5	158 (3rd Of 14)	2.2 (11th of 14)

However, during 1976-77 only one implementation activity was reported, and that was an information meeting. Team meetings are not taking place currently, even within the rather limited circles of the original teams. An investigator who visited Team 4 thinks it is "unlikely that USMES will survive in the area unless something is done to support teachers who have already been trained and efforts are made to do further training."

The attitudes of individual team members reinforce this picture of balancing strengths and weaknesses in the state of the team.

Majority-Concurrence Items, Team 4

Item	*Response*
The resource team is an appropriate mechanism for disseminating and implementing USMES.	STRONGLY AGREE
The team members don't enjoy working together.	STRONGLY DISAGREE
The team effectively utilizes the district resources to disseminate and implement USMES.	MILDLY AGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE
The team members derive personal satisfaction from being part of the team	STRONGLY AGREE

Team members are generally quite positive in their responses. However, unlike most teams, the majority did not agree that "the team will continue to function next year.

An investigator who visited the team found "enthusiasm still high" and USMES still very much alive among teachers in certain isolated locations. Our view is that the strength of USMES in the area derives from two sources. There are a great many "survivors" from the effective, numerous, and well-funded workshops held in the area in previous years. Individuals who attended these workshops, although they have not received any recent support from the team, are still doing well, in cases

where their schools are hospitable to USMES. Second, team members located in one very strong school are still using USMES, and this school has the potential to have a significant effect on nearby schools if active support from the principal is forthcoming.

It is not altogether clear what has led the team into this rather unusual situation, but the following hypotheses are suggested.

1. At least two of the three team components were evolved originally "with money in mind." That is, they were extremely successful in securing NSF funding for implementation activities at an early stage, and they believed funding would continue to be available. Further, there was a relatively large amount of USMES central staff implementation activity in the region early in the project. As a result, the team components did not require the internal organization other teams have needed in order to establish local implementations of USMES. Now that outside funds have to some extent "dried up," the team is not well prepared to support local implementation activity.

2. The present "official" structure of the team is very different from the structure under which it functioned in the past. The current structure treats as a single entity a group that has never met en masse. Indeed, team members, when asked if they anticipated changes in structure for the team in the future, observed that "there is no structure and no point in any structure unless there is a need to get together for a workshop." The components of the team do not correspond to its de facto sub-divisions: That is, the so-called university component is actually split between two of the original teams, and the team has, according to its members, "never centralized through the local university."

   It is tempting to suggest that inappropriate efforts on the part of the central office to consolidate this team are the source of the team's current organizational problems. However, this seems less than satisfactory as an explanation, since the team is now behaving as if no consolidation attempts have been made at all. Rather, we think that the team was not given a motive for consolidating itself early enough in its history, and that it cannot now do so.

   Current needs of the team appear less compatible with those of its leaders than was true at an earlier stage. Two of the three leaders are university academics. Although these leaders wish to discharge their responsibilities to the project in an honorable fashion, the professional rewards are almost

certainly greater for running large workshops such as those of two and three years ago than for providing the follow-up support to teachers that perhaps is now necessary. This situation appears to retard the activity of the team.

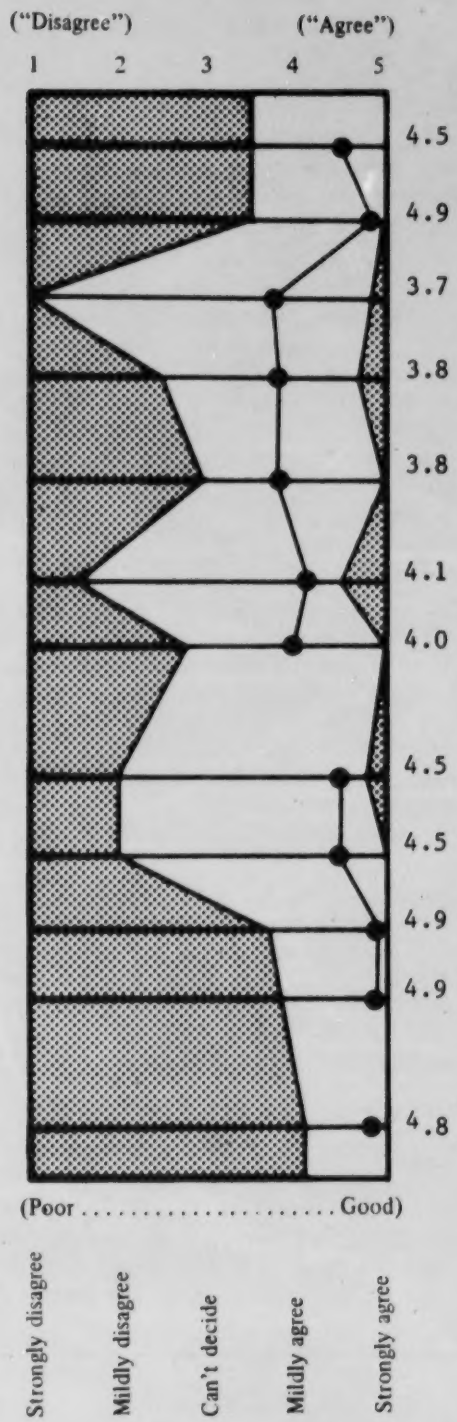
This last hypothesis is supported by an on-site investigator who writes, "I feel that a team coordinator or coordinating council, which would include members of all three components in addition to the present leaders, would very likely begin to make things happen...." We believe that the thrust underlying this observation is not that the present leaders are unskilled (since they were extremely effective at an earlier stage) but that their own career interests do not mesh very closely with the current needs of the team. Our on-site investigator suggests "hiring a coordinator on a full- or part-time basis (as Team 3 has done), so that something might begin to happen." Setting up an USMES "council" (like that described in our discussion of Team 6), might also be a good adaptive change for Team 4.

SUMMARY

Team 4 has strength but no organization. Due to an early history of well-funded workshops and a number of structural pecularities within the team, true consolidation has never taken place. Unless this consolidation occurs, it is our belief that the team, and the use of USMES outside the team, will not survive very long.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 4



TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic
2. The resource team is an appropriate mechanism for disseminating and implementing USMES
4. There is adequate communication between the team and other school personnel
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s)
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities
9. The team effectively utilizes the district resources to disseminate and implement USMES
10. The team will [continue] to function next year

WITHIN THE TEAM

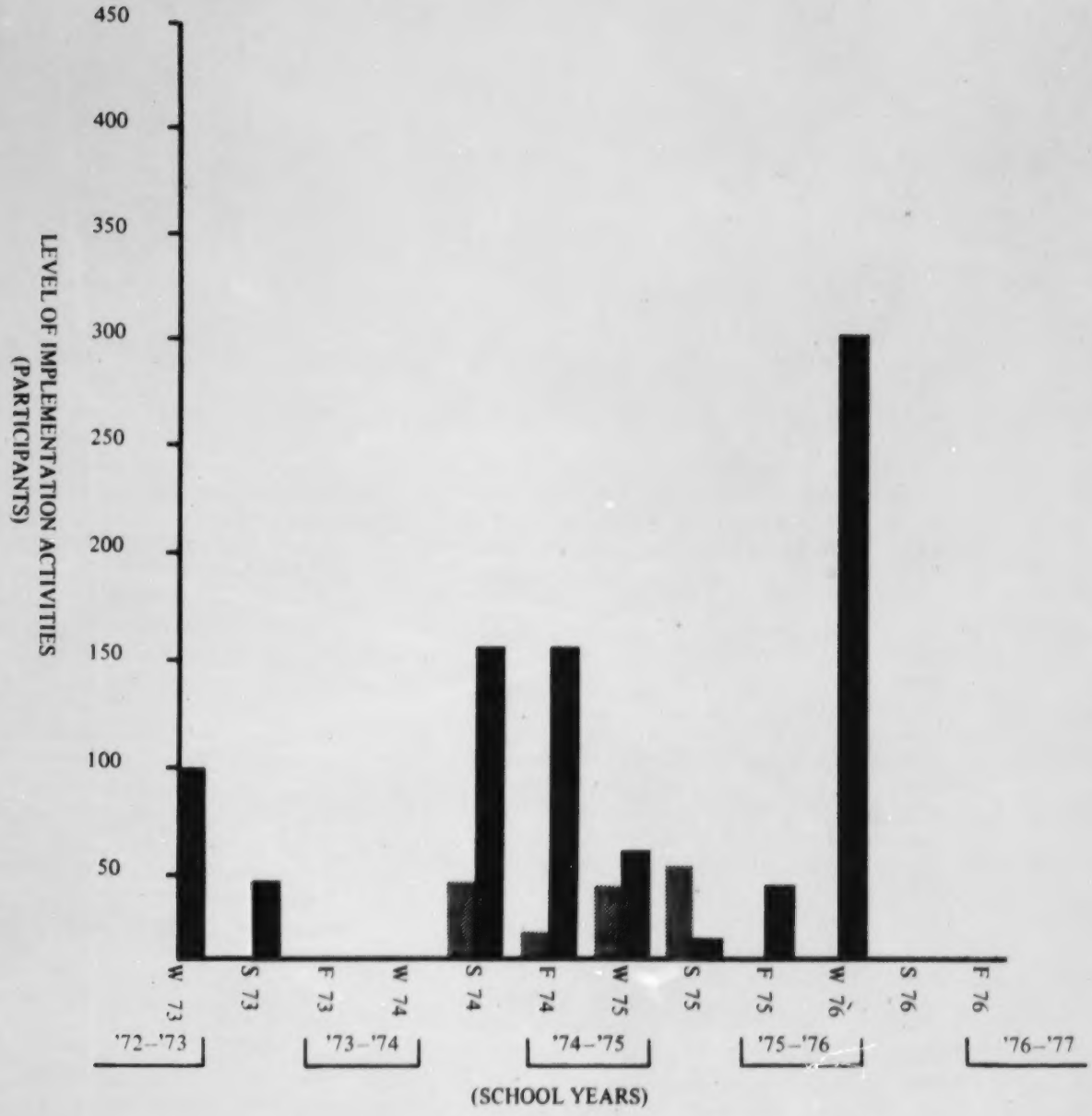
3. There is adequate communication among team members
6. The team effectively utilizes the strengths of the members to achieve its goals
7. The team members . . . enjoy working together
12. The team members derive personal satisfaction from being part of the team

THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 4



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants

Informational Participants

RESOURCE TEAM 5: Single District

Team 5 is contained in a single school within an upper-middle-class suburban school district in one of the middle Atlantic states. The total population served is about 7,000. The students are 99 percent white and 1 percent black. The school is recognized as a model school, in that it has a reputation locally for innovative developments. As team members noted in a recent interview, the original implementation of USMES at the school, following the Arlington ('74) workshop, was facilitated by a "then-current educational philosophy," by "help from parents," by the availability of materials from a games resource center, and by the recognized innovative character of the school itself. Conditions were favorable to USMES, and "allowed teachers to experiemnt." More recent contacts between the team and its environment have not been as positive as these beginnings would suggest.

A reasonably large number of persons have been reached (232 individuals, according to our records) in 19 information meetings, but no new USMES implementations have appeared in the district. Only the school at which Team 5 is located has any current USMES activity. No workshops have been held for personnel outside the host school since the creation of the team. At a recent interview, the idea of disseminating and implementing USMES outside the school struck team members as a novel idea! However, they responded to the suggestion with enthusiasm.

Team 5 has some serious problems. Although some of the teachers on the team are actively doing USMES with their own classes, the host school's innovative posture may soon change. The school principal is contemplating a number of measures to "tighten up" the school, a move that appears in part to be a response to parental pressure to concentrate on basic skills. Since the teachers at the school, appear to be strongly devoted to innovative teaching, a rather serious conflict between administration and faculty has arisen, which threatens to disrupt the school in a way that might destroy the USMES program there.

The internal workings of the team have been far from ideal. Of the team members trained at a national USMES workshop, only the present team leader continues to be active. Some teachers have left the school, others have left the team because of conflicts. The present team leader is a regular class-room teacher in the school. Although respected by the team members, this leader notes that it is "really difficult to influence teacher behavior," with no real authority.

Given these conditions--only one original team member and lack of administrative support--it is impressive that Team 5 even exists. The present leader deserves credit for training, locally, a whole new team when the nationally-trained team dissolved.

Indeed, the team seems to be a rallying point for the survival of the school as an innovative institution. It is actively engaged in the struggle to maintain the school's innovative posture, by endeavoring to convince parents and the principal that order can be maintained without total reorganization. To this end a two-tiered USMES program has been instituted. On one level, regular USMES classroom challenges are carried out by individual teachers. On another, challenges directly motivated by the principal's threatened change in policy are pursued by the school at large. Students are working on problems relating to discipline, safety, and playground use.

The attitudes of the team members, as reflected in the majority-concurrence items on the team questionnaire, are typical of small, nonproliferating teams in this study.

Majority-Concurrence Items, Team 5

Item	*Response*
The resource team is an appropriate mechansim for disseminating and implementing USMES.	MILDLY AGREE
There is adequate communication among team members.	STRONGLY AGREE
The team effectively utilizes the strengths of the members to achieve its goals.	STRONGLY AGREE
The team members don't enjoy working together.	STRONGLY DISAGREE

Majority-Concurrence Items, Team 5 continued

Item	*Response*
The team effectively utilizes the district resources to disseminate and implement USMES.	MILDLY AGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE
The team members derive personal satisfaction from being part of the team.	MILDLY AGREE

Given its circumstances, the team is vulnerable to accidents. A single event such as a "crackdown" at the host school could "shoot the team out from under its members," no matter how skillful or dedicated they are. Its implementation base is vulnerable. Even a small, one-district team, if it is able to spread USMES to neighboring schools (see Team 2) is quite secure by comparison with a nonproliferating team. On the other hand, the team is quite resistant to conditions under which a large team would simply wither, such as lack of funding or adequate organization and structure. Team 5 seems to have survived one very difficult time, and is taking strong action toward surviving another.

An interesting question is whether, after a period of dormancy (from the point of view of spreading USMES implementations), a team such as this one can begin to function more broadly to bring USMES to the schools around it. Unfortunately, a number of issues frustrate our attempts to predict what will happen.

1. It is not clear, for example, whether the role of the host school as an innovative school within the district will be an asset or a liability. Will other schools be inclined to adopt USMES because it comes from a leader in the district, or will they shun USMES because they associate it with what they may regard as the innovative excesses of an earlier period? Will they regard USMES as an activity appropriate only to innovative schools?

2. Internally, it is not clear whether the host school's history of innovation will be practically advantageous to USMES (foster it) or disadvantageous to it (lead to its being purged along with other new curriculum methods in a "back-to-basics" consolidation). The results of the two-tiered program may prove significant.

3. If the program helps to restore order in the school, USMES might emerge as the ally of those who want to preserve or strengthen certain standards in the school as well as those who want the freedom to try experimental programs. If this should happen, the host school's implementation of USMES would be strongly vested with approval from both sides and USMES might be perceived by other schools as a solution to the polarizing tendencies of "back-to-basics" concerns and innovation. However, one should not assume that this development would be entirely desirable (see Team 10, where a social development of USMES has been carried forward with great functional success, but perhaps at the cost of mutating USMES into something more like an administrative method than a curriculum philosophy).

4. It is too soon to know whether the present team will be particularly effective because members are trained locally and are self-motivated, or whether their lack of central office workshop training will prove a liability.

5. The team leader appears so far to be able to motivate team members to provide follow-up training and generally to hold the team together in a difficult situation. Whether this will be adequate support over time is not certain. The team leader, a classroom teacher, is likely to encounter difficulties arising from her lack of formal authority over other teachers, and from the tenuous structure of her relationship with individuals higher in the school district hierarchy.

6. Another reason it is difficult to predict this team's future is that the role of the school principal is unclear. Initially, he "thought USMES was the type of program that would fit well into the school." Recently, however, team members feel he has withdrawn support. The principal is on a leave of absence this year. If, on his return, he is impressed by the teachers' attempts to bring greater order to the school through USMES, he may come to see USMES as an ally in a difficult situation.

7. Finally, it is not clear what will motivate new team members to participate actively in a dissemination/implementation program in the future. While team members sounded interested in the idea of spreading USMES to other schools, goals of dissemination and implementation have not been highlighted by the leader. It is not clear where the incentive for broader implementation would come from.

SUMMARY

Team 5 is small and hardy. It has been completely reformed by the active and energetic team leader, using untrained personnel. Its survival is in doubt, due to local problems that are not directly associated with USMES per se.

If the team survives, it may emerge from its present phase of dormancy and spread USMES in its district or surrounding districts. Hitherto the team has not done so. It now consists only of the USMES teachers of a single innovative school and lacks the district-level support that would facilitate proliferation.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 5

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.4
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.4
4. There is adequate communication between the team and other school personnel — 3.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.3
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 4.4
9. The team effectively utilizes the district resources to disseminate and implement USMES — 3.8
10. The team will [continue] to function next year — 4.5

WITHIN THE TEAM

3. There is adequate communication among team members — 4.6
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.7
7. The team members . . . enjoy working together — 5.0
12. The team members derive personal satisfaction from being part of the team — 3.9

THE USMES PROGRAM

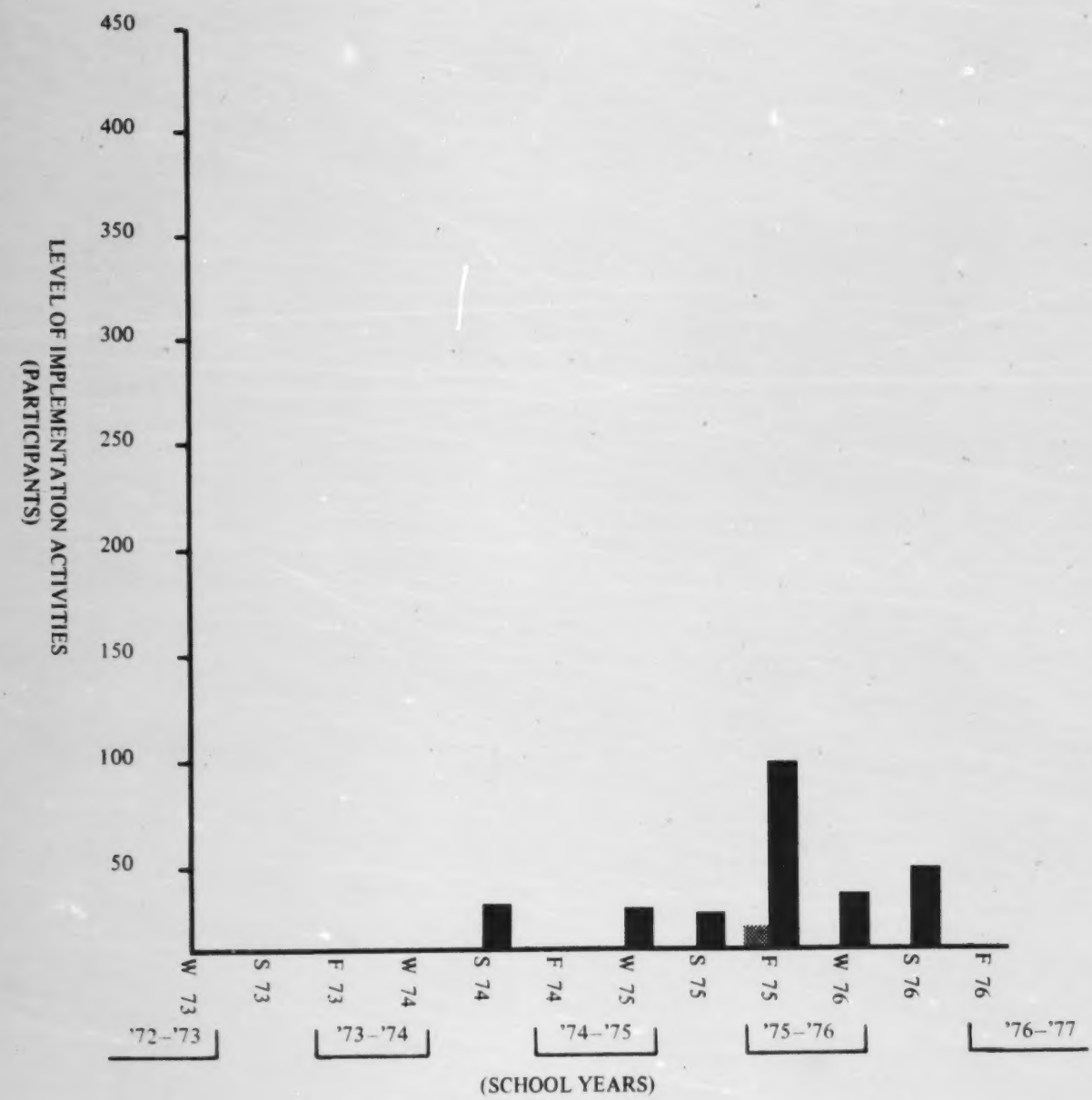
11. The team feels that the USMES approach to teaching and learning is important — 4.6

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 5



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Workshop Participants
Informational Participants

RESOURCE TEAM 6: Multiple District + Intermediate Agency + University

To even a greater extent than Team 1, Team 6 represents a method for implementing USMES by developing a symbiotic relationship with an existing program. In the case of Team 6, that program is a statewide program called Technology for Children ("T4C"). The function of USMES in this collaboration is to "aid T4C teachers with problem-solving approaches, "and to function as the focus for a second Technology for Children graduate in-service college course."

The prospective implementation site for Team 6 is an entire state in the northeastern United States with a population of several million. More than any other teams in this study, Team 6 is conceived not as an entity for training USMES teachers, but as a superordinate entity designed to form and support local teams within the area it serves. Four teams, corresponding to and administered by four separate educational improvement centers under the State Department of Education, have been formed. Since Team 6 is serving the needs of an established statewide organization, T4C, and is taking advantage of that program's association with the educational improvement centers, it has been able to initiate local USMES implementations very quickly.

History

After preliminary discussions held in the fall and winter of 1975 with the T4C's advisory council and USMES Central Staff, 28 teachers and their schools volunteered to a four month trial implementation. This period followed a two-day orientation workshop. Two experienced developmental USMES teachers conducted the two-day orientation with the aid of college staff from a nearby state and USMES Central Staff. The two experienced USMES developmental teachers then followed-up on the workshop by visiting the trial implementation teachers once a month for four months. A third experienced USMES teacher joined in the follow-up meetings.

At the conclusion of the trial experience participants very favorably recommended the continuation and expansion of the joint T4C-USMES partnership.

A two-week summer Resource Team Workshop provided the next development. At this time, the nucleus of state resource teams focused on the workshop. Twenty-two teachers/administrators, college staff and Education Improvement Center staff came together. The three USMES developmental teachers led this workshop with the aid and support of the T4C staff.

The implementation of USMES has been aided by a state mandate, the "thorough and efficient education" law, which directs schools to make problem solving a major "process goal." The State Department of Education is aware that one way to heed this mandate at the elementary school level in a very direct way is by promoting the combined T4C and USMES effort. Of course, developments along these lines depend on future interpretation of the intent of this law.

Present Circumstances

Of the four local teams initially set up by Team 6, only one is judged by our on-site investigator to be strong enough to continue its activities if support from the statewide T4C program should cease. This team, however, has set up a dissemination and implementation program that is carried out on a regular basis and employs the facilities of its local education improvement center. This successful local team is now, according to our on-site investigator, capable of giving significant help to the other teams set up by Team 6.

This local team employs quite a systematic approach to implementation and dissemination that is somewhat different from any other in this study. Initial contact is made through one of two possible types of dissemination activities:

- o A two-hour "Awareness Workship," at which USMES is discussed, usually along with some other issue of current concern, such as USMES and basic skills, USMES and humanistic education, etc.;
- o A four-hour "Involvement Workshop," in which hands-on experience is provided. In general, time considerations determine which of these two approaches will be employed.

Participants in both of these dissemination activities are later given the option of participating in a summer workship of one week duration, which offers much fuller training in T4C/USMES teaching and classroom curriculum organization and techniques. One interesting feature of this training is that it introduces the notion of USMES "mini-challenges." The concept underlying the mini-challenge is that both students and teachers can become comfortable more easily with the idea of USMES if

they know their first experience will be a short, easy, trial challenge. This is an interesting departure from the basic concept of USMES teacher training and classroom use held by most central staff personnel. Nevertheless, some staff members, including the on-site investigator for Team 6, think it may be a sound mechanism that can lead to involvement in challenges of longer duration.

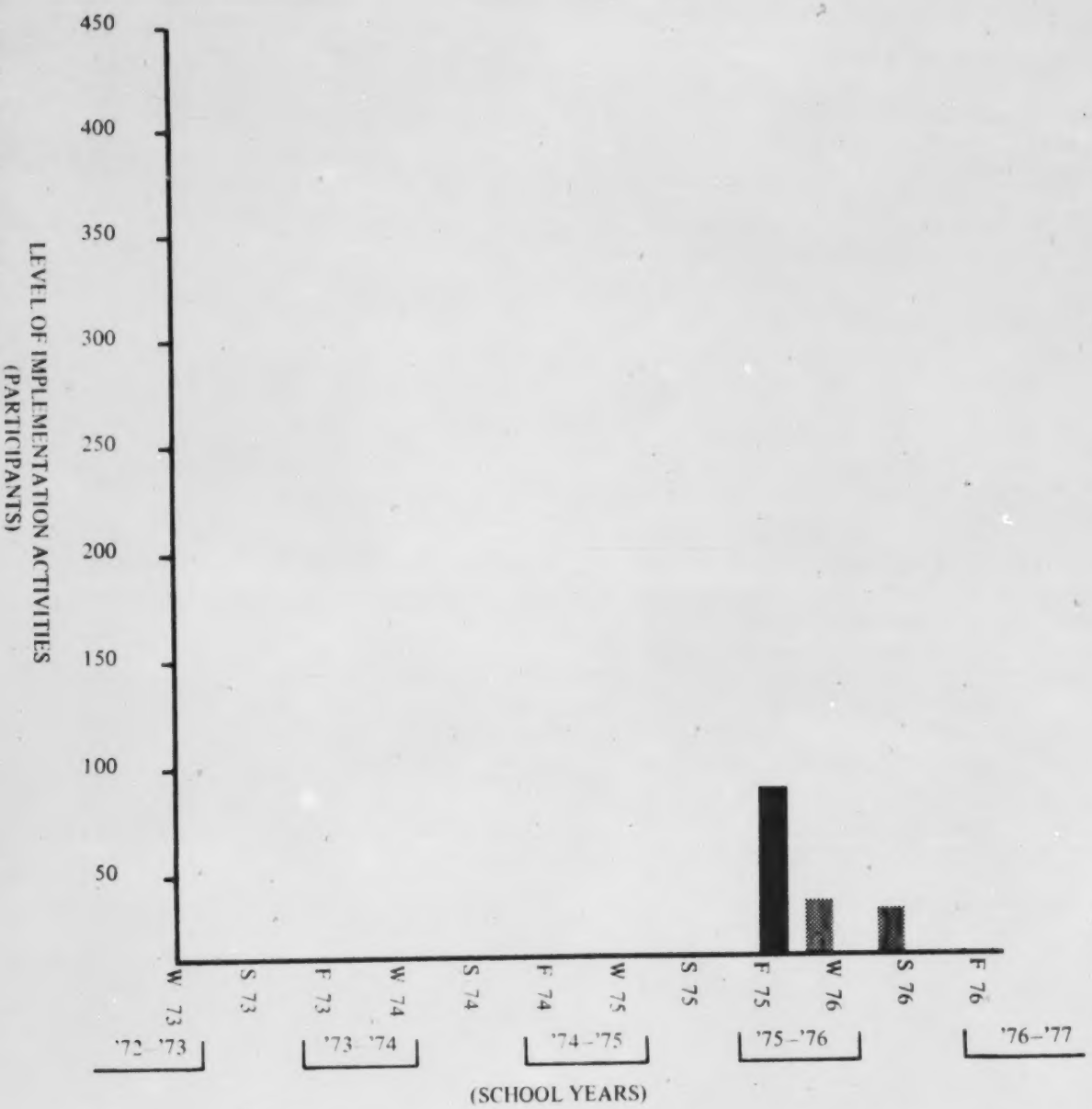
The remaining three teams are expected to become operational with more people available from the work of the on-going team. Presently, however, they depend to some extent on the continued assistance of Team 6, delivered through the statewide T4C program. This statewide program is funded annually, but since funds have now been committed to support it through 1977-78, it appears that these three local teams will survive.

SUMMARY

Team 6 is an entity for creating and nourishing local resource teams. It was formed, not by team training at an USMES national workshop, but by collaboration and discussion among state officials, local USMES development teachers, and USMES Central Staff personnel. The form of implementation represented by this team--symbiosis with an existing statewide education program--has been quite effective in spreading USMES over a large area in a short time.

Although the future of Team 6 may be limited by having a close relationship with an annually-funded statewide program, the local resource teams set up by Team 6 may, in some cases, be strong enough to continue their implementation efforts indefinitely with local resources. It is hoped that as many local teams as possible will achieve self-sufficiency, in case state-level support is withdrawn after 1977-78.

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 6



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Workshop Participants
Informational Participants

RESOURCE TEAM 7: Single District + University

Team 7 serves a middle western urban area of average socioeconomic status. Racially the population mix is 85 percent white, 12 percent black and 3 percent oriental, Native American, and Chicano. The population of the area is about 280,000.

Most of the team members were trained at the Arlington ('74) national workshop; some additional members were trained locally. The following table shows the team's implementation activities.

Summary of Implementation Activities, Team 7

Type of Activity	*No.*	*Indiv. Reached*	*Indiv./Member-Yr*
Informationals	3	57 (15th of 15)	2.6 (14th of 14)
Workshops	2	110 (6th of 15)	5.1 (7th of 14)
Follow-up activities	4	410 (Formal nonclassroom activities)	

The team's early record was quite good, but it is presently in poor condition. This state of affairs is reflected in responses to the team questionnaire. Majority-concurrence response to the proposition, "The team effectively utilizes the strengths of the members to achieve its goals," was "mildly disagree"; to the proposition, "The team effectively utilizes the district resources to disseminate and implement USMES," the majority again disagreed mildly. Study-wide, more than 80 percent of all individual responses to these propositions are more favorable than these. Furthermore, of the seven team members, four members responded to the proposition, "The team will cease to function next year," with indecision, and two members agreed with the proposition. This represents the most negative whole-team response to this item in the study.

When asked what personal satisfaction they derive from the program, respondents voiced frustration. Typical answers were: "Frustrated because it is not being accepted as it should have been." "Frustrating more than rewarding." "Frustration has resulted because there is not more done."

Team 7 has no present plans for implementation activities. Our investigator reports that there is little USMES presently going on in the area, and agrees that "Team 7 is in real trouble."

The reasons why the team is not presently successful are complex. central office personnel have various views on the subject, but in general they speak of present difficulties in terms of complex leadership problems. Some of the hypotheses are:

- The team leader, a member of the school administration, although active early in the program, has largely abandoned active promotion of USMES, but does not wish to relinquish leadership.

- The team leader does not have time to promote the program actively indefinitely, but no one else wishes to assume leadership, now that the team leader has been credited with the early success of the program.

- The team leader was so successful in promoting USMES early in the program that she exhausted her usefulness to the project by her personal success, since she is now too busy to be very active in managing the team.

Team personnel offer other explanations:

- There has been inadequate contact between university and other team personnel.

- There have been too few team meetings.

- The original team included a number of people who were not really interested in USMES; this was because some of the personnel who would have been interested were not available to attend the national workshop, and substitutes had to be found. More than half of the original team (according to one estimate) found the USMES philosophy inconsistent with their own style of teaching.

- "Back-to-basics" pressures in the district detracts from USMES.

- Past efforts at training large numbers of people who were not necessarily interested have produced diminishing returns.

- Teachers have been "over-inserviced" in all kinds of curriculum matters.
- "The hard thing about this curriculum is the unwillingness of team members and teachers in the district to be risk takers."
- "The team needs to determine whether USMES can work under its present structure."
- "There is no advocate for USMES in the district." (Note: The team leader works in the district office.)
- "Teachers who came to the local workshops lacked a full understanding of what they were being trained for."
- "It's hard to stock and maintain the Design Lab."
- "USMES does not meet with some people's preconceived ideas."
- "USMES cannot compete with the current record keeping that teachers must do now."
- "For some reason, teachers do not attempt more than one challenge."

To understand what has done wrong, it may be profitable to consider some of these items singly.

- *Inadequate Contact Between University and Other Personnel:* This is correct, but it is not clear that contact among the non university parts of the team was adequate either. In fact, the university and the district did collaborate effectively on a large workshop, and the university seems to have been effective in giving course exposure to USMES.
- *Initial Team Consisted of Members not Really Interested in USMES:* This problem is mentioned by three of the 15 teams in the study, and we believe it arises unavoidably when team members to be trained at national workshops are selected locally. If more than half of the original team was at odds with the "USMES philosophy" before and after the workshop, this fact alone could account for the team's failure, despite able and active early leadership.
- *Past Efforts at Training Large Numbers of People Who Were not Necessarily Interested Have Produced Diminishing Returns:* Conceivably there can be such a thing as too much funding for the good of a team; this may have been the case with Team 7 at an early stage. However, the results most likely would have been less negative if more team members who served as workshop staff had been sympathetic to USMES.

- *Teachers Have Been Over-Inserviced in All Kinds of Curriculum Matters:* This may indicate that teachers who were not really interested were trained. We are not inclined to view this as an independent factor contributing to the problems experienced by Team 7, since it applies equally, within broad limits, to all the teams in this study.

- *Team Members and Teachers Within the District Are Unwilling to Be Risk Takers:* It is possible that the professional climate in the area discourages risk taking to a significant extent. If this is the case, it may be an important factor in the failure of Team 7.

- *There Is No Advocate for USMES in the District:* This comment is almost certainly not directed to any issues involving the formal makeup of the team; it is, we suspect, better understood as an expression of disaffection with present team leadership.

- *It's Hard to Stock and Maintain the Design Lab:* We are inclined to regard this as a symptom of trouble rather than a cause of difficulty; even quite successful implementations of USMES frequently do without adequate Design Lab support.

- *USMES Cannot Compete with the Current Record Keeping That Teachers Must Do Now:* This issue, we suspect, may be very important. If it is impractical for teachers both to use the USMES program and to meet their record-keeping obligations for the district, USMES cannot survive.

- *For Some Reason, Teachers Do Not Attempt More Than One Challenge:* This is an interesting observation, which might be explained in several ways. Failure to do more than one challenge might be attributed to weakness in the follow-up activities of the resource team. This is plausible; although the number of formal follow-up meetings was large, these activities were not carried out in the classroom. Another explanation may be that the program is perhaps impractical for teachers in the district, as suggested by the previous point, because it is difficult to meet existing reporting requirements while employing USMES in the classroom. This seems quite possible. Or the reason may be that the program as conveyed by Team 7 is not a good program or that the program was not conveyed clearly in the workshops. It is impossible to confirm (or refute) this idea directly, but it is corroborated by indications that team personnel were not sold on USMES, and that local workshop training was shallow and unsatisfactory.

We believe that the implementation is not well adapted to the decision-making structure of the district. Consider the team-produced decision-making matrix shown below.

TEAM 7

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				XO		
PLANNING *(setting forth means to accomplish objectives)*				XO		
PROGRAMMING *(determining specific activities)*				O		X
ALLOCATING RESOURCES *(financial and human resources necessary)*		O		X		
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*				O		X

In our opinion, the contrast between USMES and the other program shown in the matrix is significant. The other program allows for programming and evaluation at the curriculum specialist level and allocating resources at the school board level. Presumably, because curriculum specialists have a stake in the success of that program, they are strongly motivated to secure funding at the school board level. With USMES, programming and evaluation is done at the classroom teacher level; this leaves the curriculum specialists with weaker motives to promote USMES before the school board; and, as it happens, funds are not allocated for USMES under Team 7 above the curriculum specialist level.

Thus, curriculum specialists must find "leftover" resources for USMES, a program in which they are involved to a relatively small degree. This is obviously a poor formula for the success of USMES. Possibly this rather poor adaptation with the local school system was allowed to arise early in the history of the team because such an adaptation was not poor when outside funds (such as NSF or USMES project funds) were available.

SUMMARY

Team 7 is in trouble by all accounts. Its continued survival is in doubt. We are inclined tentatively to suggest the following reasons for this current bad situation:

- The present team leader is unable to devote much time to the team, but cannot or does not wish to allow someone else to assume leadership.
- The original team included many members who were inactive because they did not believe in USMES.
- The district's professional climate and its reporting requirements for individual teachers may make the use of USMES relatively impractical from a professional point of view.
- Workshop training has not been sufficiently selective in choosing genuinely interested participants.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 7

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 3.9
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.0
4. There is adequate communication between the team and other school personnel — 2.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 3.9
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 3.8
9. The team effectively utilizes the district resources to disseminate and implement USMES — 2.2
10. The team will [continue] to function next year — 2.9

WITHIN THE TEAM

3. There is adequate communication among team members — 2.0
6. The team effectively utilizes the strengths of the members to achieve its goals — 2.2
7. The team members . . . enjoy working together — 3.7
12. The team members derive personal satisfaction from being part of the team — 4.0

THE USMES PROGRAM

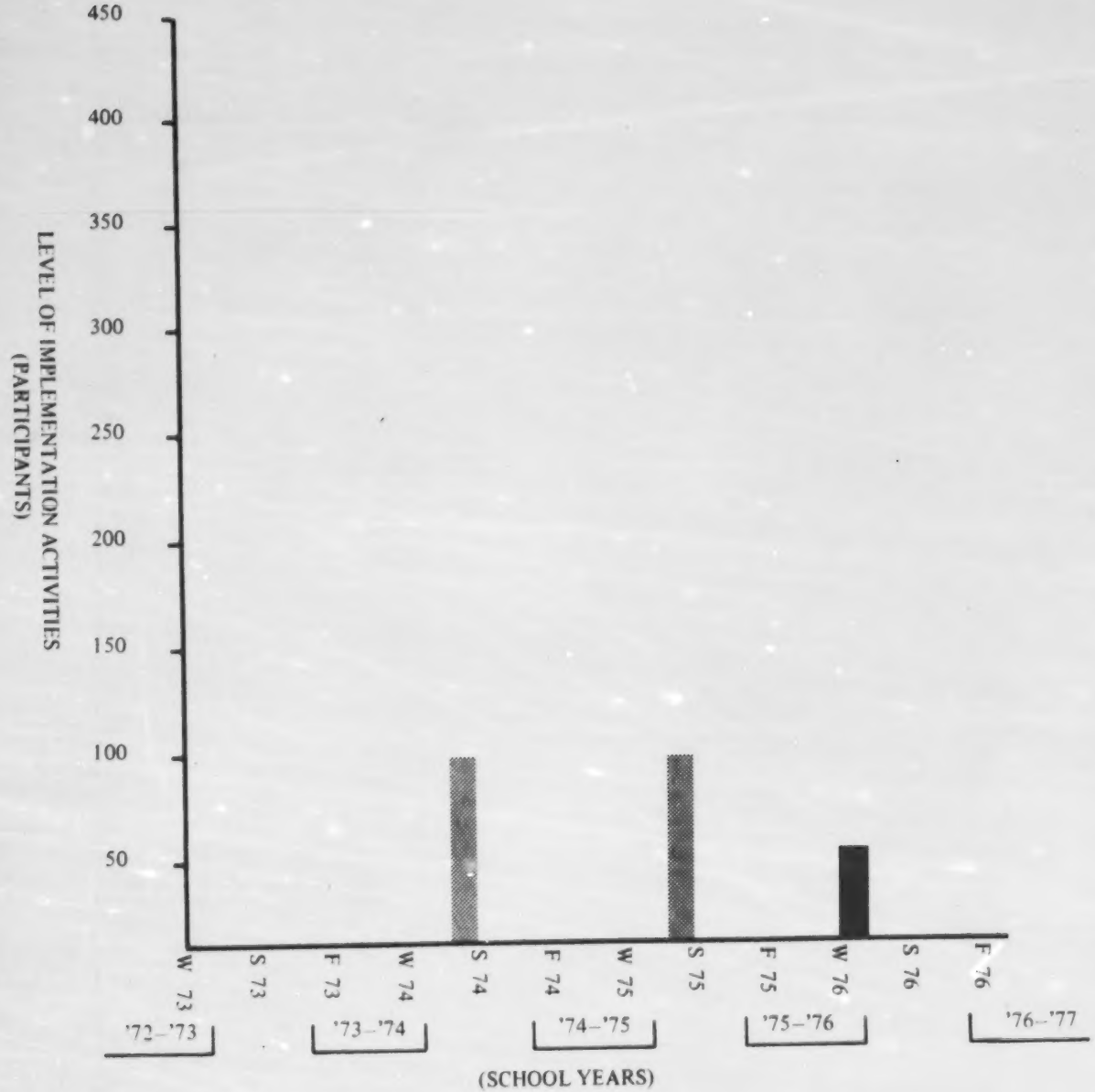
11. The team feels that the USMES approach to teaching and learning is important — 4.1

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 7



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 8: Single District

The area served by Team 8 is a large metropolitan district, with a population of about three million, divided into smaller administrative areas. The total range of schools served by the team is very wide, encompassing all racial groups and socioeconomic conditions.

The team has a long history. The earliest implementation activity took place in July 1973. Parts of the team were trained at East Lansing ('73), Santa Cruz ('74), and St. Louis ('75). The total number of members trained at national workshops--51--is more than twice the number in any other team in this study.

The team now consists of an "USMES professional group," a steering group, and several other active members. In all, there are about 15 active members.

Team 8 has achieved only moderate success among the teams in this study. Although the total number of workshops and informational meetings is very large, the ratio of individuals reached to nationally-trained team members (the return on the "investment") is smaller than the ratio for most teams.

Summary of Implementation Activities, Team 8

Type of Activity	*No.*	*Indivs. Reached*	*Indivs./Member-Yr*
Informationals	25	608(4th of 15)	3.3(13th of 14)
Workshops	18	445(1st of 15)	2.4(10th of 14)

It appears that the team members themselves are active and able. The internal health of the team also appears to be quite good. Team members recently made a very positive impression on our site investigator, who reports their "enthusiasm and promise for success."

Some of the contrast between the team's promise and its rather equivocal success in dealing with its environment is displayed in the majority-concurrence items of the recently administered team questionnaire.

Majority-Concurrence Items, Team 8

Item	*Response*
The team members don't enjoy working together.	STRONGLY DISAGREE
The team is able to cope with unanticipated problems with minimum disturbance to team activities.	CAN'T DECIDE
The team effectively utilizes the district resources to disseminate and implement USMES.	MILDLY AGREE
The team will cease to function next year.	STRONGLY DISAGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE*
The team members derive personal satisfaction from being part of the team.	STRONGLY AGREE*

As these results show, the team members are very pleased with the team and with USMES. However, they are not impressed by the team's ability to cope "with unanticipated problems" (75 percent of all respondents, study-wide, were more positive on this issue than the

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*Indicates unanimous response

majority of Team 8). Likewise, while individuals study-wide strongly disagreed with the proposition, "The team's dissemination and implementation goals are unrealistic", a majority of Team 8 did not share this view. And whereas individuals study-wide agreed that "The resource team is an appropriate mechanism for disseminating and implementing USMES," this was not the majority view of Team 8.

In interviews, team members repeatedly made comments to our investigator such as, "The team feels it has not been very effective in meeting its goals."

Team members are dissatisfied with the local support the team receives. They cite "lack of administration support" and "lack of motivation at the area and district level" as significant obstacles to their efforts. Yet they do not claim that the professional or political climate of the district is generally inhospitable to USMES (as it is, we suspect, in the case of Team 7). Rather, they maintain that the district fails to give consistent and coherent support: "The district grants adequate support, but there seems to be little interest at the central area to support the program on an ongoing basis. Interest is sporadic."

Furthermore, "lack of [USMES] central office support" is cited several times as a problem.

We suspect that all of these symptoms devolve from a single circumstance that has always been recognized by the team and by the USMES central staff as an impediment to the growth and success of the team: The subdivided structure of the very large school district in which Team 8 is located.

This district is composed of administrative areas. These areas are significant from the standpoint of USMES implementation, because one cannot cross area boundaries when inviting teachers to attend workshops. This does not mean teachers are forbidden to attend a workshop sponsored in another area; however, release time and salary credits are not made available except for workshops held in the teachers' own area. The typical response of an area administrator to a request to attend a workshop in another area might be paraphrased, "Very good, but instead let's have a workshop of our own."

Thus, implementation is not only more difficult than it would be if the district were an administrative unit, but also more difficult than if Team 8 were a regional team serving a number of different districts, because workshops could then be held on "neutral" administrative territory.

One way the USMES project has attempted to deal with the problem of areas is to train a very large number of team members. The cost of training 51 members was very great, but this measure was seen by USMES central staff as necessary in order to place team members in as many areas as possible.

Another consequence of the area problem, indirect but quite serious, is the lack of a local coordinator having authority over more than one area. The USMES central staff was virtually forced to undertake a leadership role in coordinating the functions of the separate fragments of the team, despite the presence of competent local personnel. The role played by the USMES central staff has led Team 8 into a sort of dependency on "Boston," and presumably accounts for the current feelings of "lack of central office support," now that direct, on-site, assistance is no longer possible. One might suggest that a "welfare mentality" has arisen induced by excessive (although necessary) central staff involvement.

Another consequence that might, at least hypothetically, be attributed to the cellular administrative structure of the district is the difficulty USMES has had in finding a real partisan in the district administration. It might be argued that the only type of USMES supporter who could facilitate the use of the program in a manner transcending area boundaries, would be someone in the central office of the district. However, it appears that such individuals tend to administer many programs at once, rather than serve as a partisan for any particular program. Thus, the type of support Team 8 needs to solve its leadership and bureaucratic problems does not seem to be available.

To get another persepctive on this dilemma, USMES central staff members were asked how the problems in this district might be attacked "if you had it to do all over again." One person suggested introducing the program at the level of the district board of education, rather than at the level of the district central office. This approach seems to have a number of advantages. First, if the board could be induced to mandate the program, this would produce a more stable and consistent base of support than administrative approval at the district office level would produce. Second, support of the program at board level might make it possible for individual areas to host local workshops without raising questions of proprietorship in the minds of administrators from other areas. Finally, central district administrators might feel free to become USMES partisans, once the board had given its support.

Another suggestion was to attempt to secure state approval for the program, because of the unusually powerful influence state approval has on program adoption in the area served by Team 8.

SUMMARY

Team 8 is internally strong, but structurally not well adapted to the rather difficult political environment in which it exists. The team may continue to make small gains in the area. If money can be found to pay a full-time coordinator, the team may be able to mount a stronger follow-up program than has been possible to date. Despite the formal difficulties of its environment, the team might then be able to make considerable gains.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 8

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.5
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.0
4. There is adequate communication between the team and other school personnel — 3.5
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.0
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 3.0
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.0
10. The team will [continue] to function next year — 4.8

WITHIN THE TEAM

3. There is adequate communication among team members — 4.0
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.2
7. The team members . . . enjoy working together — 4.9
12. The team members derive personal satisfaction from being part of the team — 5.0

THE USMES PROGRAM

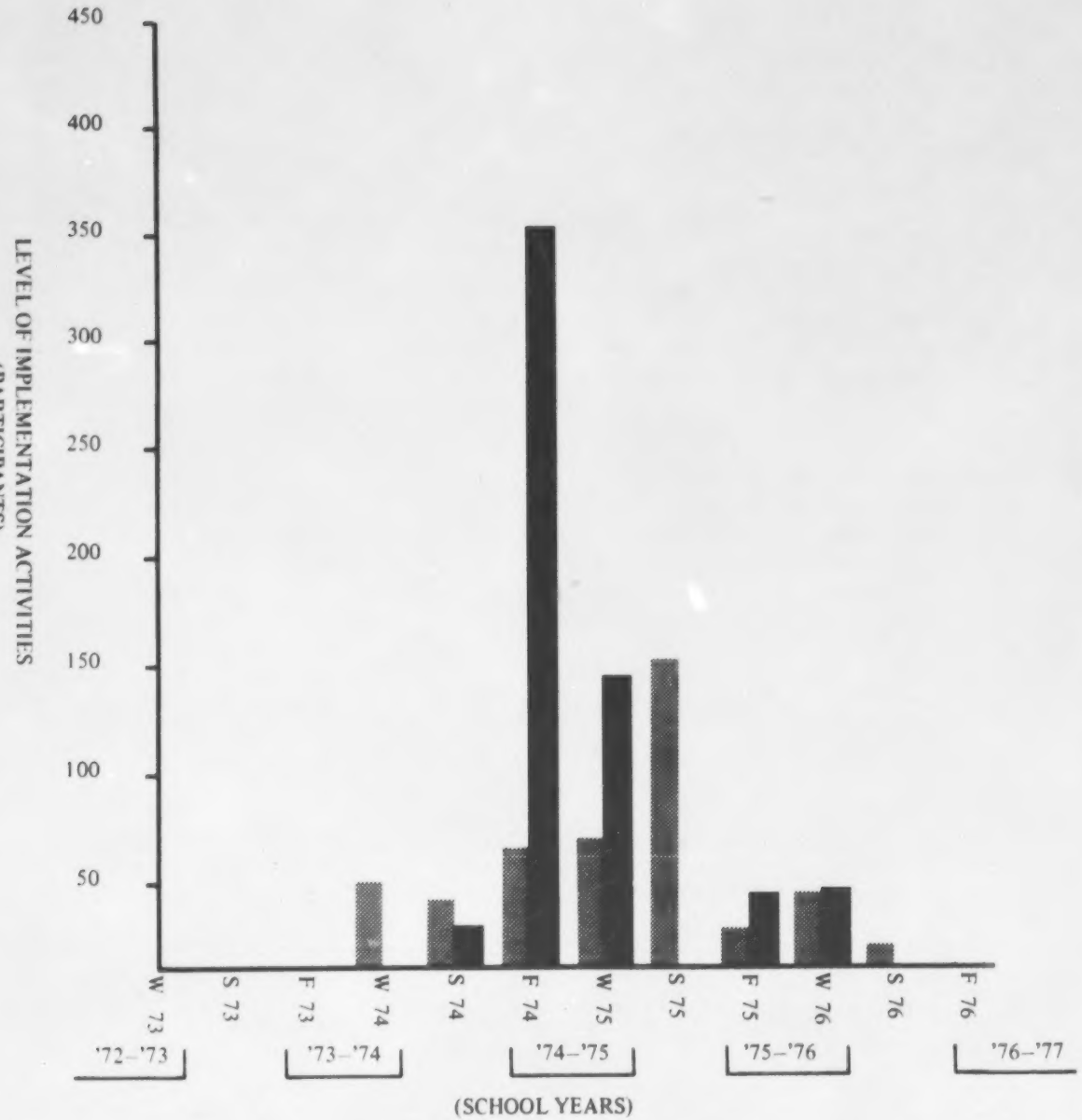
11. The team feels that the USMES approach to teaching and learning is important — 5.0

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 8



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 9: Multiple District + University

Team 9 serves a large suburban and farming community of about 1.5 million, of mixed (but predominantly middle class) socioeconomic status. Racially, the proportions among those served are approximately 56 percent, 33 percent oriental, 10 percent black, and less than 1 percent Native American. The district is located in the western United States

The team was formed as a single district team in the Fall of 1973. Seven team members were trained at the East Lansing ('73) workshop. The team was later expanded into a regional, multi-district team in the Fall of 1975: Nine new members were trained at the St. Louis ('75) workshop. There has been considerable attrition among the earlier members of the team, but the more recent members have remained active.

Team 9 has been extremely effective in reaching large numbers of people in its informational meetings. On the other hand, the team has given only two major workshops. The number of individuals reached per year per nationally-trained member is about average in the case of informationals, and quite low in the case of workshops.

Summary of Implementation Activities, Team 9

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	18	940 (1st of 15)	18.1 (7th of 14)
Workshops	2	92 (9th of 15)	1.8 (12th of 14

Currently, the amount of USMES being done in the district served by Team 9 is low. A recent on-site investigator "saw little USMES, except for one team member's class"; and no further implementation activities are presently planned by the team.

A number of possible explanations for the present lack of successful USMES implementation in the district have been put forward at one time or another. Some are:

- There is no state mandate for USMES, and other programs, which are state mandated, have attracted much of the potential audience away from USMES (e.g., bilingual and early childhood education programs).

- Prior to 1975, the district had been "saturated with shallow USMES" in the form of workshops and courses. There are few people in the district who have not "had one of these quick shots." (Thus, by implication, the potential audience for USMES was squandered by superficial presentation.)

- Certain members of the team are hostile to the USMES central staff, following disputes about payment.

- There seems to be little cooperation between the district office's administration and the teachers, because of recent teachers' strikes.

- College courses involving USMES don't attract students when they are offered.

- Interest in inservice training per se is waning. There is more interest in alternate modes of teacher training.

- Since the team leader is a university professor, USMES implementation activity is, of necessity, peripheral to his career. For this reason, the team leader (although able and quite popular with team members) must find time to run Team 9.

- Workshops prior to 1975 were not very selective. Participants were chiefly interested in getting quick credit, and did not take the program very seriously.

Let us consider some of these suggestions.

- *There is No State Mandate for USMES;* The state legislature, a powerful influence and guide for the educational system within which Team 9 operates, is not involved with USMES. We feel this is a rather serious matter.

TEAM 9

DECISION-MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	O					X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*	O		X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*	O					X

The degree to which USMES is different from the other "successful" project in its integration with the state and local decision-making hierarchy is quite striking. It is significant that the other program is implemented at four different levels (and thus, educators and other individuals at four different levels in the hierarchy have a professional and psychological investment in the program), whereas USMES is implemented at two levels only.

- *The District is "Saturated With Shallow USMES:"* The concept of saturation is an interesting one, and probably has a very general application. Clearly, a shallow exposure to to USMES is sometimes worse than none at all. In fact, when the present team leader took over, his job was made quite difficult by the fact that so many people had already been exposed to "shallow" USMES.

- *Team Members are Hostile to USMES Central Staff:* In Chapter VIII of a recent report on USMES student effects (Shann, et al, 1975), it is stated that "morale problems" existed among USMES development teachers. Although the problems cited by Shann arose under very different circumstances from those surrounding Team 9, our on-site investigator was particularly concerned about any reference to disaffection among team members, and investigated the matter. His report was as follows:

The problems with the two team members feeling hostile about the USMES central office appear to be something which they have expressed to the team leader and it is not a feeling shared by the other team members. These two members are chronic complainers and the other team members know it.

- *Teachers' Strikes:* This is a temporary factor, and it is felt that the bitterness engendered by this strike will soon pass.

- *Waning Interest in Inservice Training:* This is, of course, a real phenomenon, but it does not seem to be particularly characteristic of the districts served by Team 9, and does not really help us to understand why Team 9 should be having difficulties.

- *Team Leadership is Peripheral to the Career Interests of University Personnel:* The basis of this suggestion, which does not reflect discredit upon the team leader as an individual, is simply that team leadership is, by nature, something that has little effect on promotion of university personnel. Accordingly, effective team leadership on the part of academics (such as the leaders of Teams 4, 9, and 15) is limited in terms of time and effort. In point of fact, our on-site investigator reports that, although the leader is popular, his "interest and real efforts are elsewhere," and "the team is suffering from a lack of impetus toward dissemination of the specific elements characteristic of USMES."

- *Workshops Given Prior to 1975 Have Not Been Sufficiently Selective.* This is a serious problem, and many teams have commented on it. Of course, it is unlikely that this is a major cause of Team 9's problem, since relatively few workshops have been given.

The future of Team 9 seems to us rather dim. The team is not equipped to seek a state mandate. Furthermore, it would not be practical to replace the present team leader, choosing another member of the team (even if a candidate could be found and the team wanted to replace the leader), since all other active members would be limited to particular district locales by their primary career roles.

Majority-concurrence items from the team questionnaire tend to corroborate our pessimistic feelings.

Majority-Concurrence Items, Team 9

Item	*Response*
There is adequate communication among team members	MILDLY AGREE
The team members don't enjoy working together	STRONGLY DISAGREE*
The team feels that the USMES approach to teaching and learning is important	STRONGLY AGREE*
The team members derive personal satisfaction from being part of the team	STRONGLY AGREE

What is conspicuous here is the absence of certain concurrence items that appear study wide. There is no strong dissent from "the team's dissemination and implementation goals are unrealistic": In fact, no one on Team 9 strongly disagrees with the propositon. Further, there is no majority concurrence in strongly disagreeing with "The team will cease to function next year": Only one member indicates strong disagreement. Moreover, it is clear that these negative indications are not mere symptoms of disaffection, since the team members do seem to like working on the team, do feel strongly about USMES, and do seem to like each other. Items that pertain to intra-team morale show positive concurrence. Thus, it would appear that the team members share our anxiety about the survival of the team.

In view of the team's difficulties, certain changes in dissemination and implementation strategies have been suggested by the team. Change in focus "away from 'get them all' to 'get the interested ones'" has been proposed; concentrating on special programs (where there is money and a felt need for results that USMES might, with adaptation, be able to deliver) has been suggested; and an "attempt to use curriculum specialists in...implementation design and efforts" has been suggested. In general, these changes cannot be harmful and may help, although in the view of USMES central office staff, concentrating on special programs as a way to get access to funds entails an undesirable narrowing of the concept of program implementation, in that it rules out the "ordinary" implementation in which USMES was designed to work best.

*Indicates unanimous response.

SUMMARY

Team 9 has been extremely active in giving informationals but rather inactive in arranging workshops. It is now in a generally inactive phase. Serious problems seem to be competition with other programs having a state mandate, and the possibility that the strongest interests of the team leader, a professor, are elsewhere.

Morale within the team is quite good, but it seems unlikely that the team can thrive in its present environment without a change of leadership. Such a change is unlikely because the present leader is popular, and because no other team member has a career position so well suited to transcending local boundaries and jealousies in the area served by the team.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 9

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 3.5
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.5
4. There is adequate communication between the team and other school personnel — 4.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 3.5
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 3.5
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.0
10. The team will [continue] to function next year — 4.0

WITHIN THE TEAM

3. There is adequate communication among team members — 4.2
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.5
7. The team members . . . enjoy working together — 5.0
12. The team members derive personal satisfaction from being part of the team — 4.8

THE USMES PROGRAM

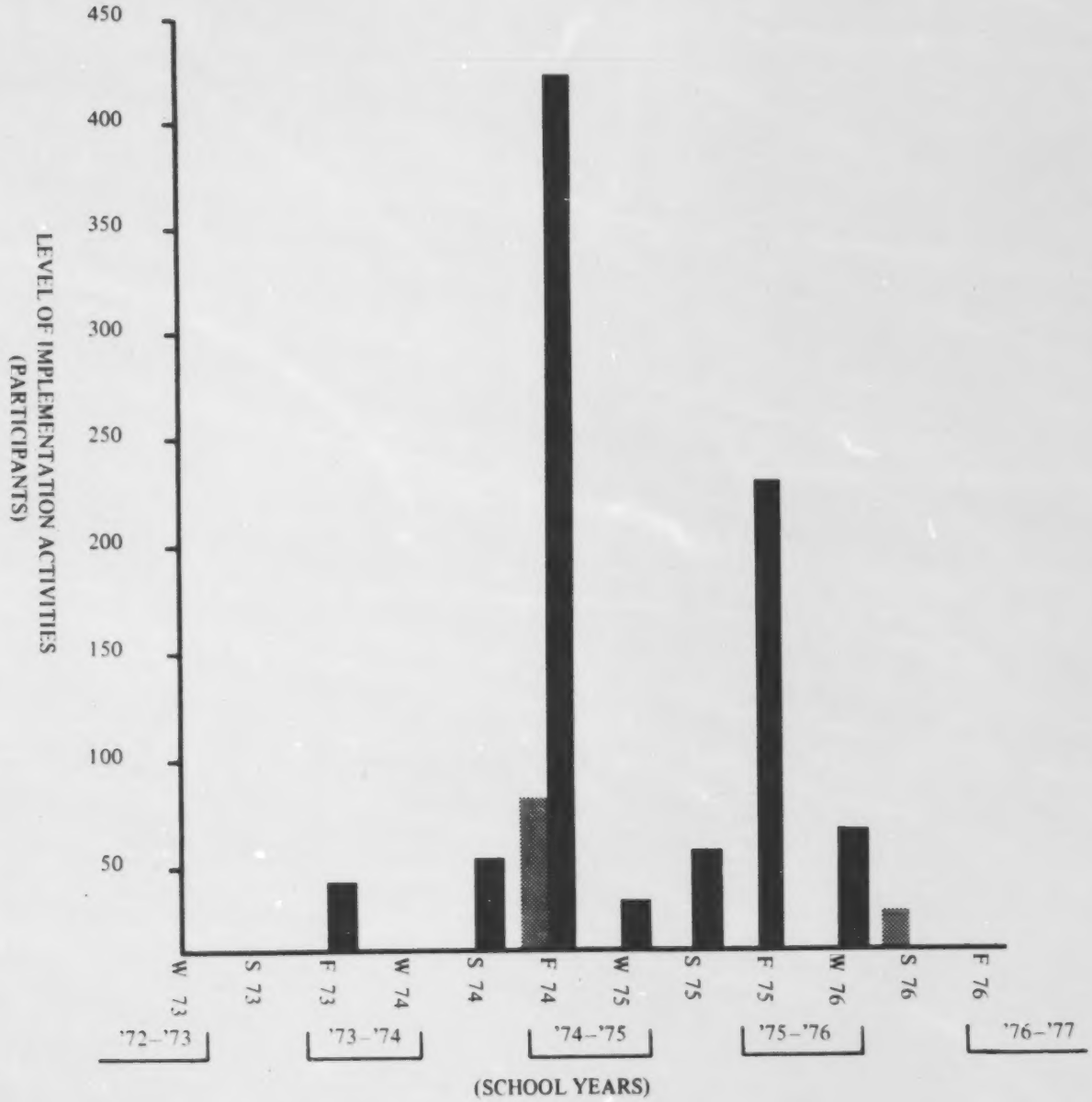
11. The team feels that the USMES approach to teaching and learning is important — 5.0

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 9



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 10: Single District + University

Resource team 10 is located in an urban community in the southern United States, with a population of nearly 2.5 million. Socioeconomic status of the area served by the team is low to lower-middle class; racial composition is 49 percent white Anglo-American, 49 percent Mexican-American, and 2 percent combined black, Asian, and Native American.

Team 10, like Teams 5 and 12, is largely a one-school, nonproliferating, team. However, unlike Teams 5 and 12, Team 10 is very powerful and effective, a "maverick" team that has developed in ways not envisioned by the USMES central staff. Several factors characterize the team.

- *Nonproliferation:* Team 10 has done little implementation outside its home school, although some dissemination has occured in cooperation with the university component. The reason implementation activity outside the school has been low is not because the team lacks support, power, or visibility. It is because the team leader, the principal of the home school, would first of all like "to make every teacher and student at the school a real problem solver."

- *No Outside Funding:* "If we get money we get it from within." It is claimed that the Team 10 implementation is cost-effective, and needs no funding. This is no doubt true, since the team has very strong support from the principal, who, as the decision-making matrix shows, controls the team's resources.

TEAM 10

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*			O			X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*			O			X
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*				O		X
EVALUATING *(appraising what is done)*			O			X

This arrangement works better for Team 10, since the team leader is the principal whose support is so important, than for several other teams studied, (e.g., 4, 8, and 15).

- *Morale:* Team 10 manifests a very high, disciplined, morale. Eleven out of 12 of the items on the team questionnaire were majority-concurrence items; response to the team questionnaire was the most favorable of all teams in the study.

Majority-Concurrence Items, Team 10

Item	*Response*
The team's dissemination and implementation goals are unrealistic	STRONGLY DISAGREE
The resource team is an appropriate mechanism for disseminating and implementing USMES	STRONGLY AGREE
There is adequate communication between the team and other school personnel	STRONGLY AGREE
The team isn't able to change its dissemination and implementation strategies to meet the needs of the district(s)	STRONGLY DISAGREE*
The team effectively utilizes the strengths of the members to achieve its goals	STRONGLY AGREE
The team members don't enjoy working together	STRONGLY DISAGREE
The team is able to cope with unanticipated problems with minimum disturbance to team activities.	STRONGLY AGREE
The team will cease to function next year	STRONGLY DISAGREE
The team feels that the USMES approach to teaching and learning is important	STRONGLY AGREE*
The team members derive personal satisfaction from being part of the team	STRONGLY AGREE*
There is adequate communication among team members	STRONGLY AGREE

---

*Indicates unanimous response

It is interesting that one respondent "strongly disagreed" that "the team effectively utilizes the strengths of the members to achieve its goals"; another respondent "strongly agreed" that "the team members don't enjoy working together." Such powerful covert feelings (there was no sign of dissent in the team interview), in the face of overwhelmingly positive general feeling, also suggests strong discipline and morale on the team. Everyone, including these dissenting respondents, strongly felt that "the team members derive personal satisfaction from being part of the team." A note from the on-site interviewer who conducted the team interview further corroborates this idea:

> It should be noted that all of the team members were reluctant to say anything here until the interviewer said that he had already interviewed the team leader and the leader did not have any objections to having the team members give their reactions. To a person, the team members then talked about the goals for their classroom, i.e., "teach _____ unit, "complete _____ unit," etc.

- *Team Growth:* This year, Team 10 doubled in size through local training of new teachers brought to the school by the principal, and chosen as USMES teachers by the existing USMES resource team. Clearly, the principal wants to strengthen the team in pursuit of the goal of "every teacher and student" being a real problem solver. Under present circumstances, principal support is an understatement for what is available to Team 10.

- *Implementation:* Team 10's intra-team implementation of USMES has some interesting characteristics. It is, according to our on-site investigator, "real problem solving," but not "classical USMES" (that is, the units developed by USMES are not used). This in itself is not rare, but it is unusual that teachers who have never done USMES before (and, indeed, have never taught regularly before) are doing units specially tailored to the school. Typically the use of such units starts after teachers have had a reasonably long period of familiarization with pre-designed units, if it occurs at all.

  Presumably this variation reflects a policy designed to overcome potential teacher resistance to USMES by providing units that are obviously useful because they are tailored to the school. Secondly, it develops the school into a strong demonstration center for USMES, since the units, when complete, contribute to the smooth operation of the

school. With strong support and corrective attention from the team leader, it seems likely that most of the team members can succeed at this. Whether they can acquire a general grasp of real problem solving through USMES is less certain.

- *The Team Leader:* The team leader selected the original team members to be trained at the St. Louis ('75) workshop as individuals who were receptive to her leadership, as well as "those who shared my educational philosophy. I wanted to play a large part in the team."

Such strong leadership, combined with the augmentation of the team by beginning teachers in 1976-77, creates a team with pronounced centralizing tendancies. This is good insofar as it creates unity and permits integration of school and USMES plans. However, what will happen to the team if the present leader leaves the school (this is a possibility for 1977-78) is less clear. Indeed, even if the local implementation of USMES at the team's home school survives the career advancement of its leader, Team 10's potential to spread USMES elsewhere may not survive, since there is little movement toward autonomy within the team.

Of course, if the present leader stays a while longer, "team members can move to do teacher training in other schools in the district," as our on-site investigator has observed, "since the team and leader will have built a strong demonstration center."

After reviewing a draft of this report the team leader provided us with the following comments to clarify the approach of the team:

> Team 10 is a one school team. It is described by Central Office USMES people as not resembling other teams, but I maintain it is a team designed to fit the needs of a specific school (the students). The University component of the team has been very supportive and all team members have been at one or more times actively involved in the teaching-learning processes at the school.
>
> Team 10 implementation costs are handled from within--the team does not view money as a problem. The principal views the securing of funding as one function that should be handled administratively by the principal.
>
> The team members were chosen by the principal to be trained at the St. Louis '75 workshop. The principal decided in the beginning to become a strong contributing member of the team.

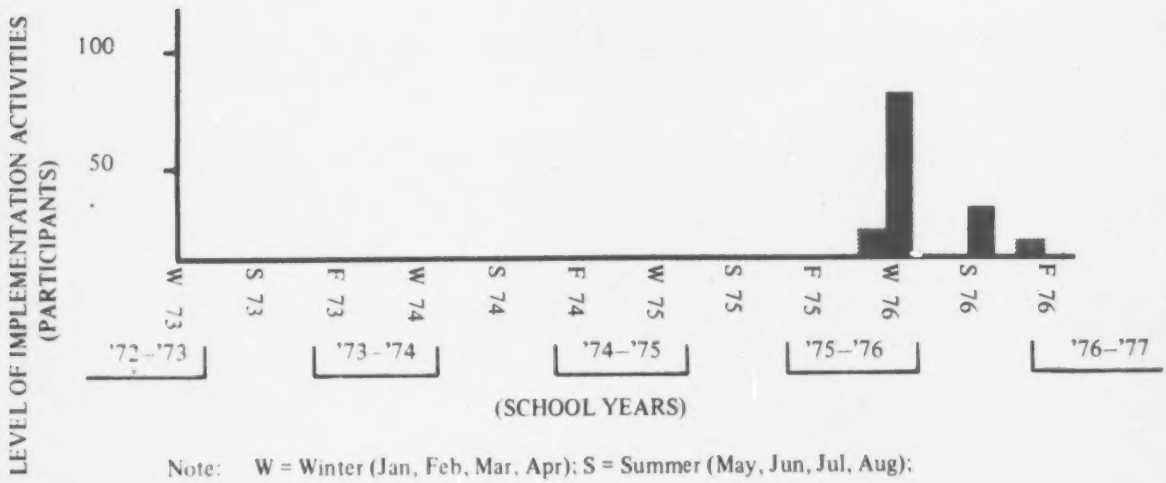
The full strength of the implementation and dissemination processes has not been realized. The team is concerned first with the "Problem Solvers" located at the school and second with dissemination within the school district. "Demonstration Center" does not describe the goal of team. The data from the questionnaires show the members of the team as being united in their attitudes toward the decision making processes and questions related to the USMES team. The team is first composed of individuals who are strong classroom teachers and secondly, complemented by other individuals who contribute support to the team as a whole.

SUMMARY

Team 10 is a strong team, largely guided and dominated by its leader, a building principal. The team is nonproliferating at present, largely because the team leader is concerned with strengthening the implementation of USMES at the team's home school.

It is our view that the future success of the team as an agency of USMES implementation and dissemination depends on the present team leader remaining in that capacity after the home-school implementation has come to full strength.

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 10



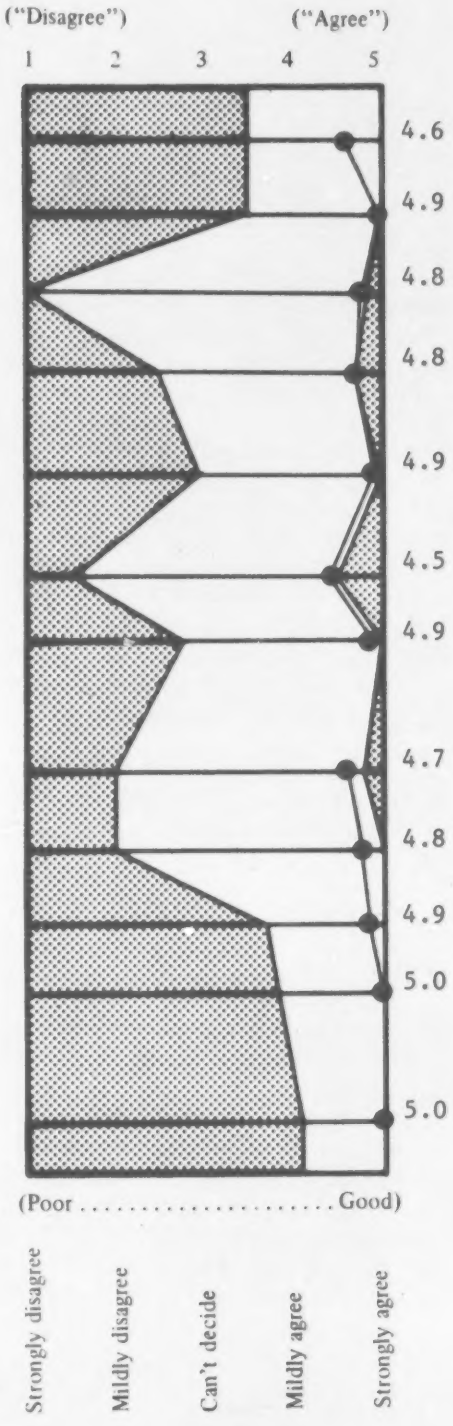
Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants

Informational Participants

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 10



TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic
2. The resource team is an appropriate mechanism for disseminating and implementing USMES
4. There is adequate communication between the team and other school personnel
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s)
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities
9. The team effectively utilizes the district resources to disseminate and implement USMES
10. The team will [continue] to function next year

WITHIN THE TEAM

3. There is adequate communication among team members
6. The team effectively utilizes the strengths of the members to achieve its goals
7. The team members . . . enjoy working together
12. The team members derive personal satisfaction from being part of the team

THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

*Shading indicates limits of median responses for all the teams in the study

Resource Team 11: Multiple District + Lab School

Team 11 serves a suburban and rural area in the southern United States. The size of the community served is about 13,000. Socioeconomic status is mixed and the racial composition is about 35 percent black and 65 percent white.

The team was formed in the summer of 1975. All six presently active members were trained at the St. Louis ('75) workshop. There has been neither attrition nor growth so far, although it is expected that, in the near future, some of the "marginal members of the team will drop," and "newer people who have a genuine interest in the program" will be added.

Team 11 has been extremely prolific in USMES dissemination through informational meetings, as the following table shows.

Summary of Implementation Activities: Team 11

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informationals	10	435	47.9 (1st of 14)
Workshops	2	57	6.3 (5th of 14)

It is notable that this team has reached more people in informational sessions per year per nationally-trained team member than any other team in this study. This may, in part, be a direct consequence of the team's location--at a university lab school--and also of its ability (as a lab school) to transcend district boundaries. Still, it seems that for so much activity to have taken place, the team must have been staffed well and favorably located. Indeed, observers agree that a great deal of the team's success has been due to the dynamism and skill of the present team leader, a lab school classroom

teacher. Some workshop training has taken place, although it would appear that a real training effort (as opposed to dissemination efforts) is not yet wholly underway.

Internally, the team presents a fairly positive picture, although some complications are indicated by majority-concurrence responses to the team questionnaire.

Majority-Concurrence Items, Team 11

Item	*Response*
The team's dissemination and implementation goals are unrealistic.	STRONGLY DISAGREE
The resource team is an appropriate mechanism for disseminating and implementing USMES.	STRONGLY AGREE*
There is adequate communication among team members.	STRONGLY AGREE
The team isn't able to change its dissemination strategies to meet the needs of the district.	MILDLY DISAGREE
The team effectively utilizes the strengths of the members to achieve its goals.	STRONGLY AGREE
The team members don't enjoy working together.	STRONGLY DISAGREE
The team is able to cope with unanticipated problems with minimum disturbance to team activities.	MILDLY AGREE
The team effectively utilizes the district resources to disseminate and implement USMES.	MILDLY AGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE
The team members derive personal satisfaction from being part of the team.	STRONGLY AGREE

*Indicates unanimous response

The team is quite confident that USMES is good, that resource teams are good, and that the team's goals are realistic. Members are less sure that the team interacts effectively with the district. Communication within the team is apparently good (which is not surprising, since the team is located at a single school). The future of the team, oddly enough, is the one area in which there is not majority concurrence. In view of the "strong" concurrence we observed across teams that "the team will continue to function next year," it seems a little strange that Team 11, a team with a successful history, does not share the optimism expressed by other teams.

We doubt that Team 11's less-than-strong certainty about its survival indicates that the team is presently in bad straits. The team has encountered moderate resistance in local implementation attempts, but it seems to be dealing with these problems. For example, the team feels that its initial strategy of allowing "the administrators in these schools with potential trainees to select people in any way they saw fit" was not a good one. Future plans involve meeting "with principals, but insisting that they allow teachers to attend all USMES presentations on a volunteer basis." Likewise, implementation attempts have been curtailed in one district "because of their school board/administrative problems," but the team has plans to go into another replacement district.

We feel instead that the survival issue is centered around members' lack of confidence in the continued support of the university lab school at which the team is based. Members view with particular trepidation future policy changes made by the present lab school director. They fear that current policies maintain an adequate level of support for the USMES program only because the school is "currently in an assessment review year," and that "when the assessment is over, that support will be lost, and the marginal members of the team will drop out."

According to our on-site observer, "There are pretty strong feelings among the team members about the lab school director's spoken words and his practices." In an attempt to discover whether the forebodings of the team were well founded, our observer made a serious attempt to find out which policies of this director were hindering, or might later hinder, the team. He reached a rather strong conclusion:

> "...I feel that this is a strong team which has a lot of support from the university and community, as well as the director of the lab school. I feel that the low morale is due more to the hard work of the...meetings,...public relations appearances,... report writing,...etc., resulting from the accreditation process.... The members have very good reasons to feel low; I just hope they will find another scapegoat before they begin to conjure up some "real" reasons for feeling hostile toward the director."

In view of this report, we are inclined to judge that most of the current malaise of the team is the result of grueling accreditation processes rather than opposition from the lab school director. Now that accreditation is complete, we expect much of the bad feeling to recede, or a least to have a less harmful effect on the morale of the team.

SUMMARY

Team 11 is, historically, a strong and effective team. It has been particularly effective in reaching large numbers of people through informational presentations. Team support comes from the university lab school at which the team is based.

Team morale is low at present because the lab school has just undergone a grueling accreditation process, and team confidence in the lab school director's future policies is not high.

It is our view that the team's low confidence in this director is in large part a result of general low morale following the recent accreditation process, rather than a reflection of hostility on the part of the director. It is our guess that the team will survive and continue to be effective.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 11

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.9
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 5.0
4. There is adequate communication between the team and other school personnel — 3.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.1
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 4.3
9. The team effectively utilizes the district resources to disseminate and implement USMES — 3.7
10. The team will [continue] to function next year — 4.5

WITHIN THE TEAM

3. There is adequate communication among team members — 4.7
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.7
7. The team members . . . enjoy working together — 4.9
12. The team members derive personal satisfaction from being part of the team — 4.7

THE USMES PROGRAM

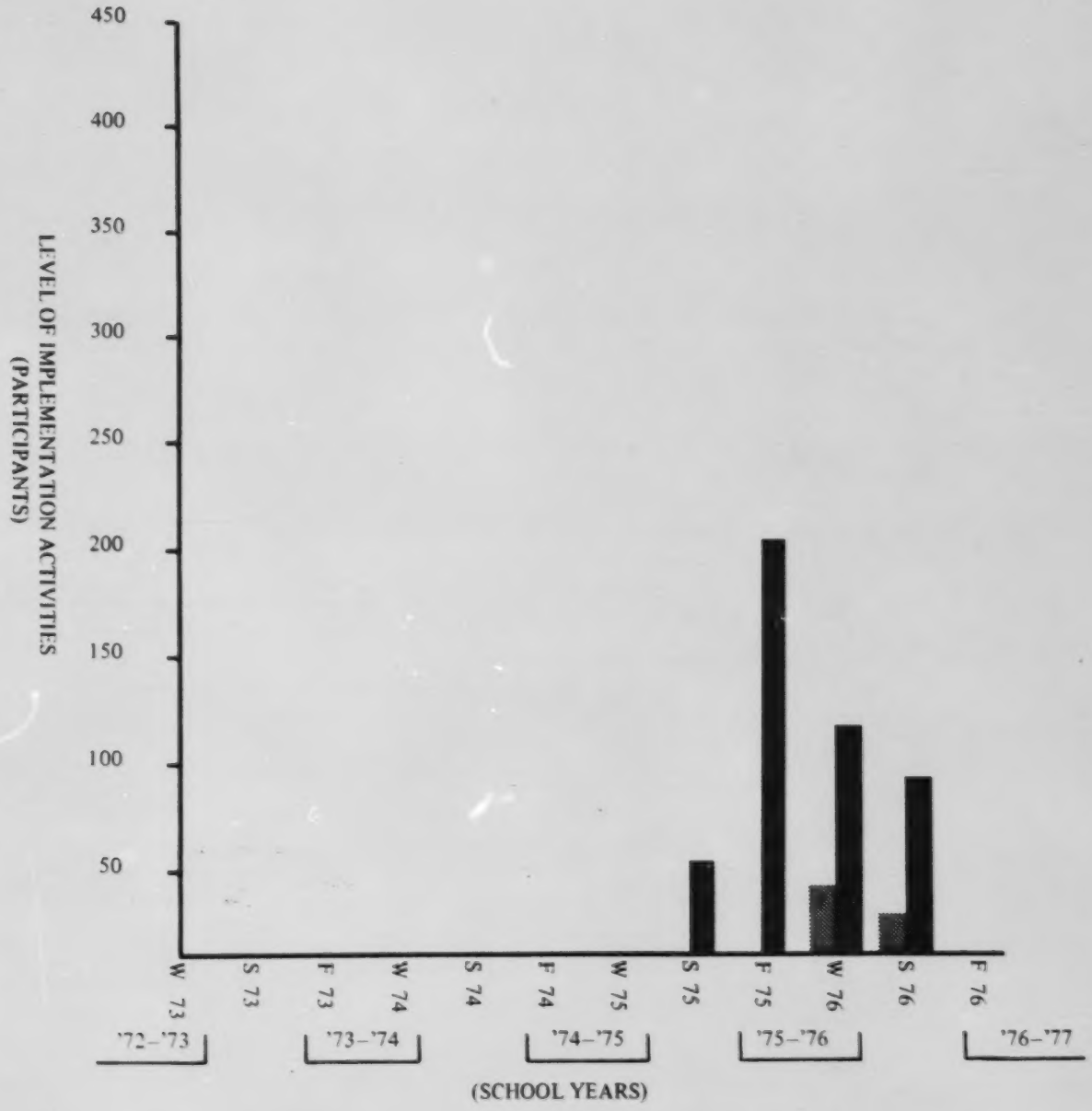
11. The team feels that the USMES approach to teaching and learning is important — 4.9

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 11



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 12: Single District + University

Team 12 serves a rural area of low to lower middle class socioeconomic status, with a population of about 40,000. The racial composition of the district is about 85 percent white, 15 percent black.

As of January 1977, the team had about ten active members. Five individuals from the team were trained at the St. Louis ('75) workshop; six others were trained locally.

The university component of the team offers preservice courses dealing with USMES. Otherwise, this team, like teams 5 and 10, is essentially non proliferating. It is hard to evaluate the effectiveness of the team, because it is presently in a dormant or consolidating stage. It is not engaged in implementation and dissemination activities in the surrounding area, and neither is it withering: Rather, it is building up an internal single-school implementation, an activity that might be called a demonstration-school dissemination strategy.

This strategy is based on the assumption that the best way to convince teachers and administrators to adopt USMES is to build a strong and effective single-school implementation, then to point to it as a "demonstration" of USMES. Unfortunately, the initial stage of building a strong single implementation has not, for any of the teams in the study, lead to the later dissemination stage that all looked forward to. There is, as yet, no evidence that this is an effective dissemination strategy.

Majority-Concurrence Items, Team 12:

Item	*Response*
The resource team is an appropriate mechanism for disseminating and implementing USMES.	MILDLY AGREE

Majority-Concurrence Items, Team 12 continued:

Item	*Response*
The team members don't enjoy working together.	STRONGLY AGREE
The team will cease to function next year.	STRONGLY DISAGREE
The team feels that the USMES approach to teaching and learning is important.	STRONGLY AGREE
The team members derive personal satisfaction from being part of the team.	STRONGLY AGREE

The team's responses can be described as typical when they are compared to the study-wide majority-concurrence table for all respondents (p. 15). Only two items present in the study-wide listing are absent from the Team 12 listing: "strong disagreement" with "The team's dissemination and implementation goals are unrealistic," and "mild agreement" with "The team effectively utilizes the district resources to disseminate USMES." In both cases, the median response for Team 12 is near the study-wide median (see p.99). No items of majority concurrence appear in Team 12's responses that are not present in the study-wide responses.

If we examine the decision-making matrix for Team 12, we see that all decisions are made at the classroom level, except those having to do with developing and allocating resources.

TEAM 12

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				O		X
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*			O			X

This profile is identical to the one for Team 10, another non-proliferating team. It is particularly striking that the development and allocation of resources takes place at the principal level and not on a higher level. This feature makes us somewhat anxious about the potential success of Team 12 when it enters its implementation phase.

If the team succeeds in setting itself up as a demonstration school without district financial support, the team will seem to be demonstrating that a strong USMES implementation can be developed without solid support at the district level. This is generally not true of USMES. Yet given the evidence of a successful, self-sufficient demonstration school in the district, any administrator or board member approached to support USMES may conclude that such support, both financial and human, is unnecessary. He or she may expect that USMES can be developed repeatedly at the building level, just as is the case in the "demonstration school."

For this reason and others (for example, the possibility of jealousy among the schools in the same district), the demonstration school strategy probably should be used with caution. However, this may be the only strategy Team 12 can adopt, given the environment in which it operates and the nature of its membership. Evidence suggests this may, in fact, be true.

First, the team did attempt to reach many individuals in the district, soon after training at the St. Louis workshop, although it has been inactive since the winter of 1976.

Summary of Implementation Activities for Team 12

	Individuals Reached	
Period	*Informationals*	*Workshops*
Winter '75	49	0
Spring '75	70	0
Fall '75	13	0
Winter '76	17	29
	149	29

In describing the experience of the team, members have talked about the ineffectiveness of "telling" rather than "showing" local people about USMES. Evidently, an active dissemination strategy was tried and rejected as unsuccessful, and then replaced by the demonstration school strategy. Also, the team leader views the demonstration school as an effective aid in selecting teachers who are truly interested in USMES as potential workshop participants: "A visit to the demonstration school help us get rid of the group that doesn't want any part of USMES and not waste time training them."

Special circumstances within the team also make the demonstration school strategy seem reasonable, if not ideal. Communication between the university and district components of the team is poor. Our on-site investigator found signs of direct, personal bad feelings between the team leader (university component) and the administrative coordinator (district). The team's response to the team questionnaire indicates that the team is generally negative about the level of communication among team members (p. 99).

Because of these poor communications, the daily life of the team is shaped at the school level, by a particularly strong principal. The goals of this principal seem to be staff development and improvement of student attitude within that school, rather than widespread implementation and dissemination of USMES. According to the team interview, school morale was quite poor when this principal arrived, and he has successfully used USMES to improve the situation. Thus, given this leader's personal motives, and the morale of the personnel he had at his disposal, it is understandable that demonstration school strategy was chosen even apart from conditions external to the team.

SUMMARY

Team 12 is strong--its survival is not in doubt--but nonproliferating Developing a demonstration school seems to be the ruling strategy. It is our view that, due to conditions both inside and outside the team, this strategy is the best available, although it is not certain that it will foster other implementations.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 12

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.5
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.2
4. There is adequate communication between the team and other school personnel — 2.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 3.5
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 4.0
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.3
10. The team will [continue] to function next year — 4.9

WITHIN THE TEAM

3. There is adequate communication among team members — 2.3
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.0
7. The team members . . . enjoy working together — 4.9
12. The team members derive personal satisfaction from being part of the team — 4.8

THE USMES PROGRAM

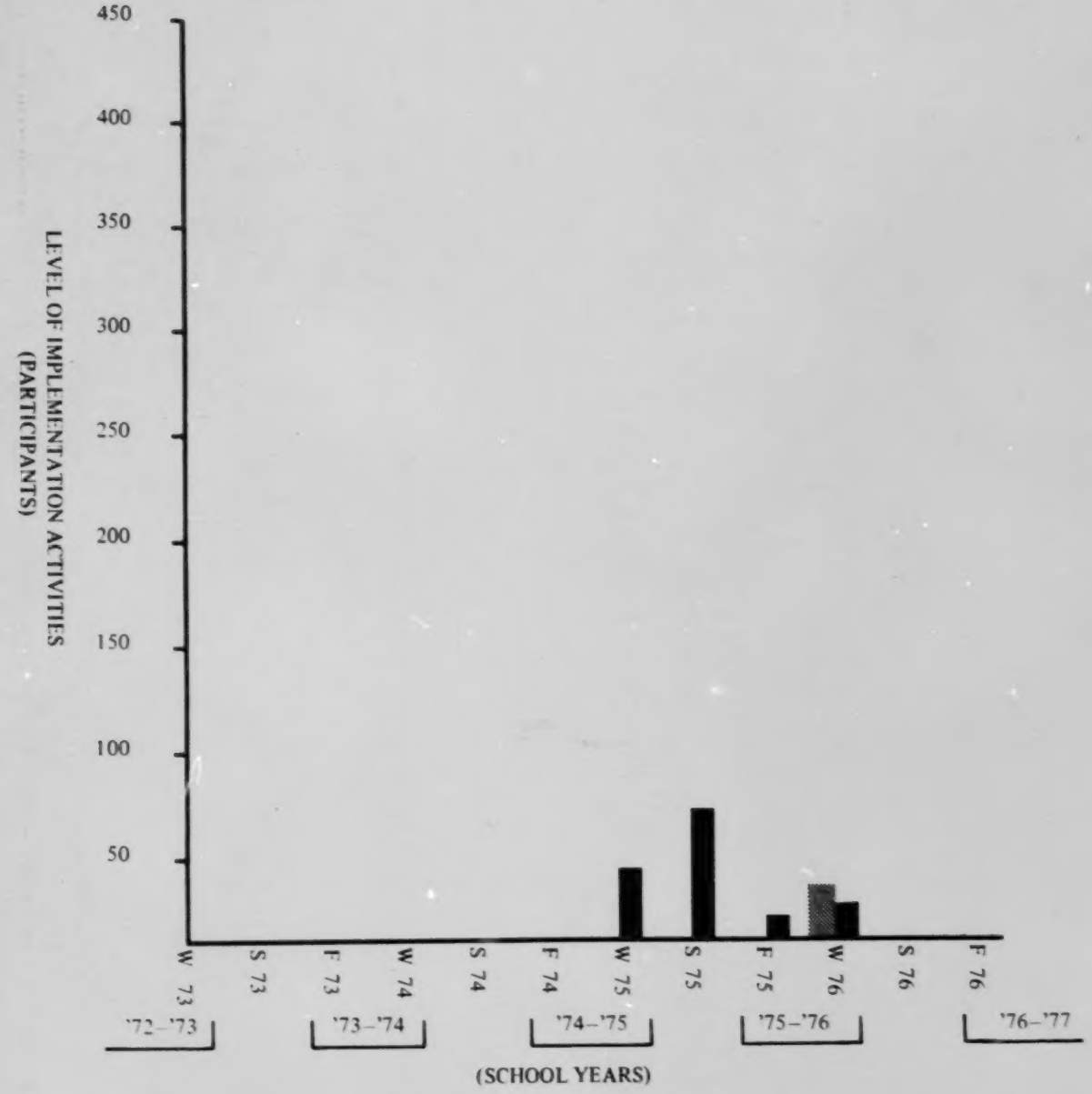
11. The team feels that the USMES approach to teaching and learning is important — 4.8

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 12



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

Resource Team 13: Single District

Team 13 serves an urban/suburban community of about 50,000 people. This community is located in the northeastern United States, is of mixed socioeconomic status, and is chiefly white in racial composition.

Team 13 is a relatively old team; four members were trained at the East Lansing ('73) workshop. Two members of the original team, both classroom teachers, are still active.

The team has not been particularly successful in the past. What makes its lack of success interesting, in comparison to Teams 15 and 7, is that failure overtook the team despite the interest and ability of certain team members and a great deal of support from the school and community.

The team questionnaire results (p. 105) suggests that the team is quite weak. Both members "strongly disagree" that there is adequate communication between the team and other school personnel. Also, it is felt that the team does not effectively utilize the district resources to disseminate and implement USMES. Furthermore, as the chart on page 105 indicates, none of the responses except the response to Item 11 ("The team feels that the USMES approach to teaching and learning is important") are as high as study-wide median responses.

The implementation activity record of the team is shown below.

Summary of Implementation Activities, Team 13

	Individuals Reached	
Period	*Informationals*	*Workshops*
Fall '73	39	13
Winter '74	0	0
Summer '74	0	51

Summary of Implementation Activities, Team 13, continued

Period	*Individuals Reached* *Informationals*	*Workshops*
Fall '74	54	0
Winter '75	0	0
Summer '75	0	30
Fall '75	0	0
Winter '76	0	0
Summer '76	20	11
Fall '76	0	0
	113	105

In terms of the number of individuals reached, this is a good record. Team 13 ranked second in the study in number of workshop participants reached per nationally trained team member. However, the team agrees that the results have not been satisfactory. And, in fact, the table shows recurring convulsive effort rather than smoothly continuing activity.

In all interviews, our on-site investigator was told emphatically that the team was in poor shape. Some of the comments were: "Teachers have not been supported." "There is now a negative feeling about USMES that must be overcome." "There are lots of angry frustrated people--because of lack of success and follow through." "USMES was forced on teachers." "A problem for the team is that others make changes for them." "Negative feelings of teachers now--team must begin anew."

What has happened? We believe the following have *not* caused the team's troubles.

- *Lack of Interest on the Part of the Team or Lack of Philosophical Compatibility is Not Evident:* The present (and past) resource teams contained personnel who were employed as USMES development teachers and who, although they are pessimistic about many other things, still "feel that the USMES approach to teaching and learning is important."

- *Hostility to USMES by The District or Community is Not Evident:* The team received the following support:

  --District funding ($2000), release time, and increment credits
  --PTA funds
  --Additional money for workshops
  --Student Design Lab managers from local colleges
  --Parent staffing for Design Labs
  --Parent donations of tools
  --Science Resource Center purchase of USMES Library
  --Science Committee inclusion of USMES in workshops

Fully 22 portable Design Labs have been delivered to the district. There is good administrative support as well: There is a district Assistant Superintendent who is "very supportive" and "wants success."

Discovering what the problem is is not simple. However, we are inclined to suggest two hypotheses to explain the strange difficulties this team encountered in the face of apparently strong natural advantages.

1. *Team Leadership:* The previous team leader could not give teachers in the district the kind of support and follow-up assistance they keenly felt they needed. The present team leader is hindered by being a classroom teacher. When "money gets siphoned out of the USMES account and used in other programs," he can do nothing. When a problem exists, he lacks authority to solve it directly. Teachers are reticent in complaining to administrators who are not team members. Consequently, the "administration is saying positive things and believing them, but what is happening in the classroom doesn't correspond... Example: teachers complain among themselves, but when they have a chance to actually tell the adminstration about their complaints, they say nice things." The present leader sums up the problem by saying, "I'm team leader, but with no authority."

   These problems have created a good deal of negative feeling among potential USMES teachers in the district. Despite the desire and good will on both sides, to correct the problems and make USMES work, it is hard to get teachers and administrators to work together.

2. *District Structure:* A district science committee has considerable influence on science teaching, by studying and coordinating the use of various science curricula. The science committee had not used USMES previously because, "In the past, USMES had not been published and few materials were available.

Despite past problems, the future of the team looks relatively bright. The present team leader has been at least temporarily successful in getting the science committee to recognize and work with USMES, and pins his strongest hope for the team's future success on this development. Further, this leader has been appointed to serve as part-time district-funded USMES coordinator in 1977-78. This new arrangement is expected to effect considerable improvement in the state of USMES, both because this individual will be able to provide personal help to USMES teachers in the district and because the existence of such a coordinator further "legitimizes" USMES in the district.

SUMMARY

Team 13 is a small team with a rather long history. It has had able members and strong community support, but has not been successful. There is little USMES activity in the district at present, and much negative feeling toward USMES among the teachers in the district. We are inclined to attribute the failure of this team to problems relating to team leadership (lack of authority) and incompatibility with the district's methods for working with science curricula.

However, now that the leader of the team has been appointed part-time USMES coordinator (funded by his district) for 1977-78 and now that USMES has the support of the district science committee, it seems possible that the team will survive, and may thrive.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 13

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.5
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 3.5
4. There is adequate communication between the team and other school personnel — 1.0
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 3.5
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 3.5
9. The team effectively utilizes the district resources to disseminate and implement USMES — 1.5
10. The team will [continue] to function next year — 3.0

WITHIN THE TEAM

3. There is adequate communication among team members — 4.0
6. The team effectively utilizes the strengths of the members to achieve its goals — 2.0
7. The team members . . . enjoy working together — 4.5
12. The team members derive personal satisfaction from being part of the team — 4.5

THE USMES PROGRAM

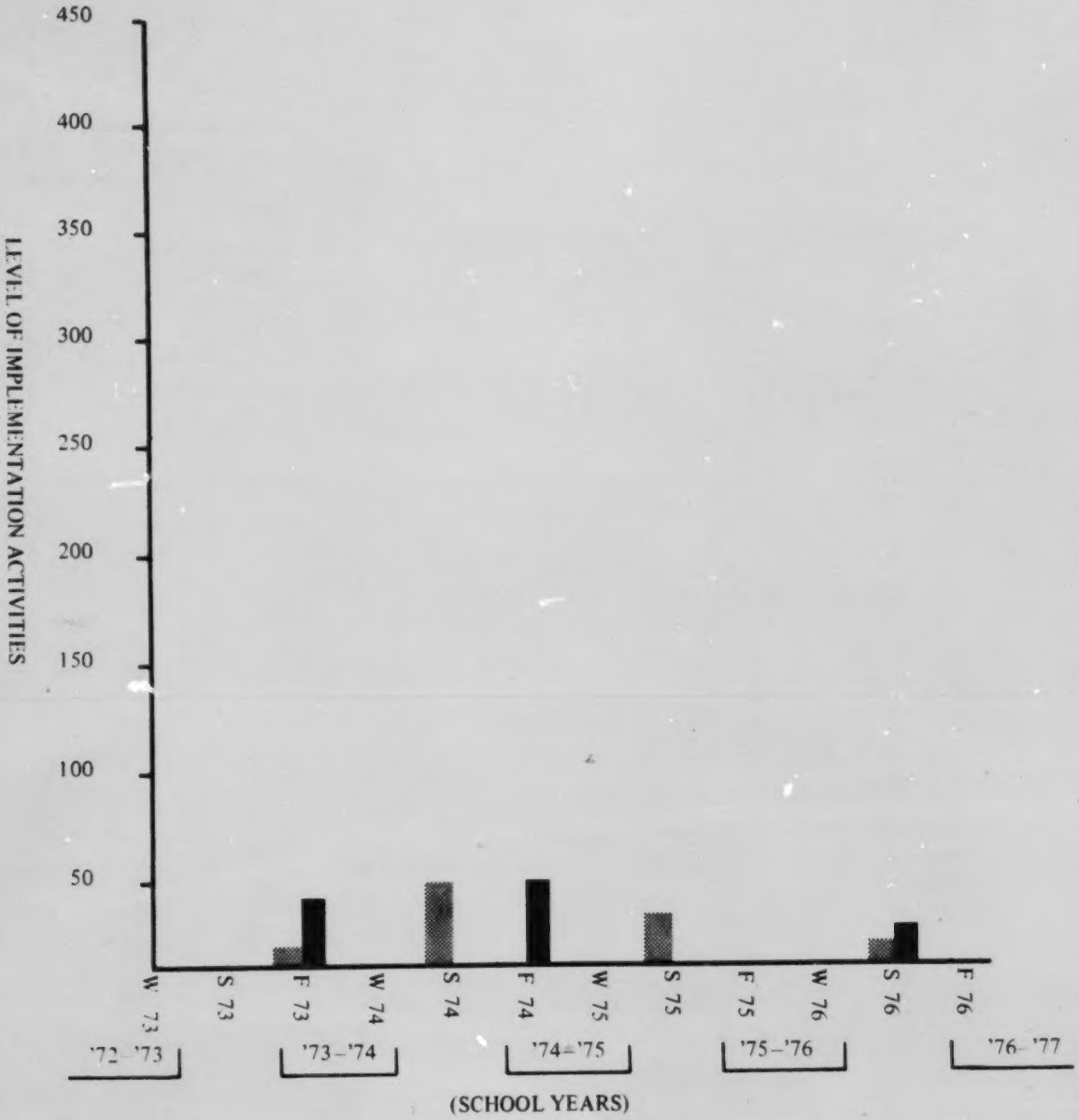
11. The team feels that the USMES approach to teaching and learning is important — 4.8

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 13



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants
Informational Participants

RESOURCE TEAM 14: Multiple District + University

Team 14 serves an urban/suburban area in the southern part of the United States, with a population of about 150,000. In one county, the socioeconomic level is low middle class, and racially the population is 70 percent black and 30 percent white. In the other, there is a middle class population, about 90 percent white and 10 percent black.

Team 14 has been in existence since the summer of 1975, and has about 15 active members. Seven of these members were trained at the St. Louis ('75) workshop.

Of all the 15 teams in this study, Team 14 seems to us most clearly to exemplify the normal or successful regional resource team, as conceived by USMES central staff personnel.

The team questionnaire elicited near-median responses on all 12 items covered (p. 111). The team's implementation activities have been quite efficient.

Summary of Implementation Activities, Team 14

Type of Activity	*No.*	*Indiv. Reached*	*Indiv. Reached/Member-Yr*
Informational	14	234	23.6 (fourth among 14)
Workshops	6	68	9.7 (third among 14)

The decision-making matrix filled out by the team shows a moderately good fit between the USMES decision-making structure of the team's environment and the "typical" decision-making structure for that locality, as represented by another successful program.

TEAM 14

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*						XO
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			XO			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*			O		X	

We suspect, however, that this apportionment of the decision-making process will permit only slow growth for the team, since the building principal (not the teachers who are using the curriculum) is in a judgmental position, and, at the same time, there is no school board or curriculum specialist involvement to facilitate the spread of USMES to other sites. Nonetheless, the matrix shows a generally sound adaptation of USMES decision making to the local structures.

Certain factors do not show up on this matrix, which, we suspect, help the team a good deal.

- *State Coordinator:* There is a state USMES coordinator, who coordinates the work of Team 14 and one other team in the state. This individual is Supervisor of Elementary Science at the state Department of Education. He brought USMES into the area to upgrade teacher training and, apparently, is pleased with the results. His impact on USMES implementation and dissemination has been profound. This leader is more effective promoting USMES by personal contact than by administrative decisions; he has done the former successfully, and has held together the widely dispersed district components of the team.

- *Regional Center:* The regional math science center is offering workshops in USMES for university credit. These workshops are sponsored by the state department of education on a regular basis for a large number of teachers.

- *Programs For Talented and Gifted Children:* Teachers of talented and gifted children form a sub population in the area in which USMES implementation can take place at an accelerated rate. At least 12 separate buildings presently use USMES with their students.

Some of the problems cited by this team (although they have not prevented the team from being successful) are:

- *A State-mandated Push For "Implementing Reading":* This is diverting resources from programs in other areas.

- *Lack of Central Staff Support:* The team received a considerable amount of USMES Central Staff support early in its history and feel the lack of it now; but this does not seem to have created great problems for the team. Thus, Team 14 is somewhat like Teams 8 and 4, although in these teams early support from the USMES central staff seems to have created more serious dependency problems.

- *Lack of Support to Teachers by Principals:* This may be a function of the decision-making structure shown in the matrix on page 108. While the principals do have evaluative responsibilities, they are not involved in any other phase of the program. They have neither a school board mandate nor curriculum specialist support for USMES to back them up. Sensing that building principal support may not be dependable may have encouraged the team toward using USMES with talented and gifted students, since TAG teachers have other supports besides the building principals.

- *Geographic Isolation:* The two district components of the team are some miles apart; contact with other teams is also minimal because of distance. Communication appears to be a continuing but surmountable problem, largely due to the efforts of the State USMES coordinator to maintain unity. The geographical isolation of Team 14 has induced the team to plan visits to schools implementing USMES in several states in the eastern United States.

- *"The Feeling That the Team Has Identified With a Project That is Now Folding":* This issue is a serious one. It arises because the USMES program passed through a crisis of funding in the spring of 1976, during which central office contact with teams was lost because of NSF policy changes. At the time it appeared that the project might be terminated abruptly, and indeed many of the planned activities of the project had to be cancelled, even though the project itself was continued.

SUMMARY

Team 14 is a successful team that seems to be operating much as the USMES central staff conceived of a regional resource team operating. Multiple components work together well, despite distances. The internal health of the team seems to be good.

It seems clear that the team is surviving, strongly, and implementing USMES through a variety of mechansims.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 14

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.8
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.9
4. There is adequate communication between the team and other school personnel — 3.5
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 4.3
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 4.5
9. The team effectively utilizes the district resources to disseminate and implement USMES — 4.1
10. The team will [continue] to function next year — 4.8

WITHIN THE TEAM

3. There is adequate communication among team members — 3.8
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.0
7. The team members . . . enjoy working together — 4.9
12. The team members derive personal satisfaction from being part of the team — 4.8

THE USMES PROGRAM

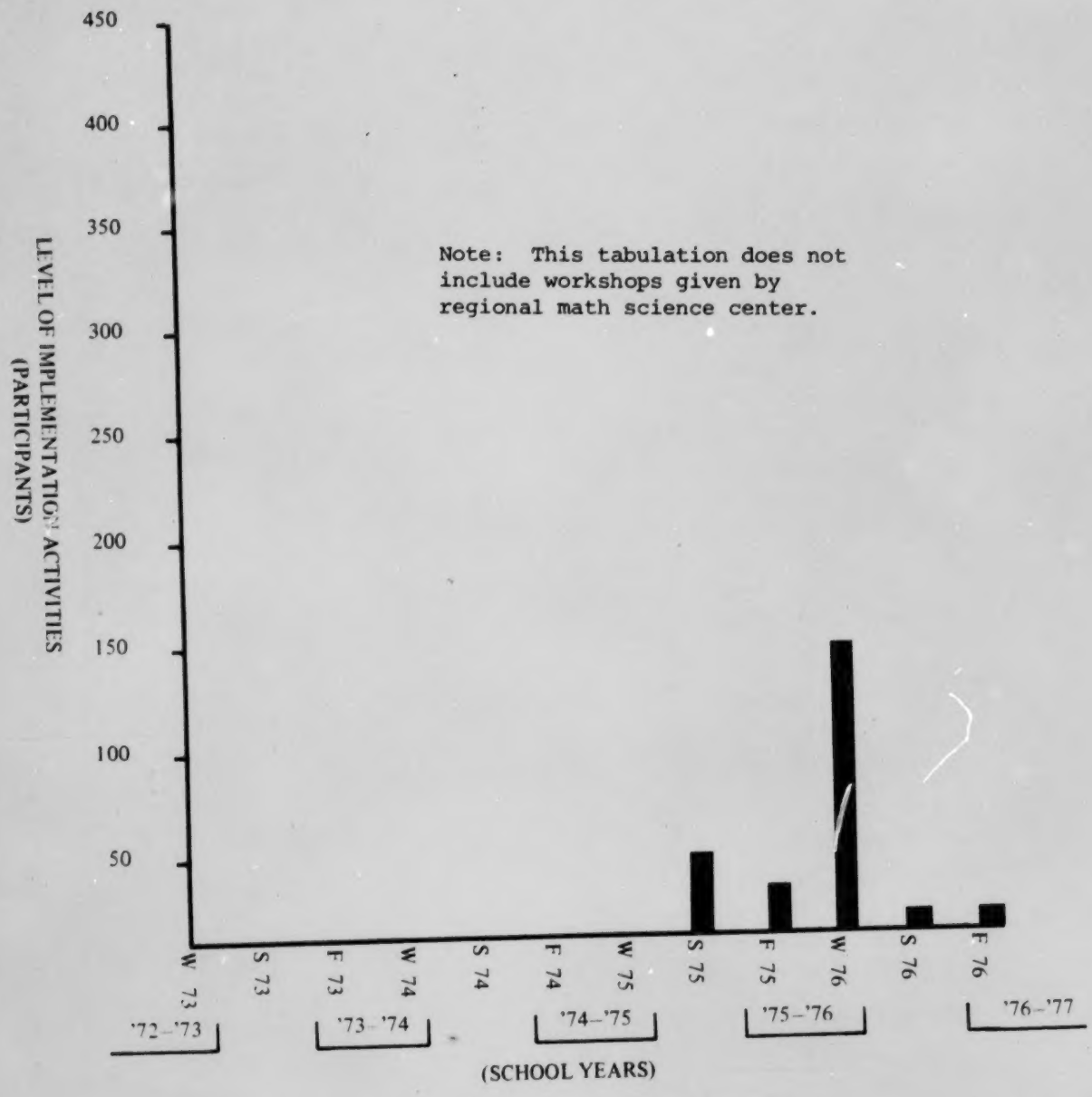
11. The team feels that the USMES approach to teaching and learning is important — 4.8

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 14



Note: W = Winter (Jan, Feb, Mar, Apr); S = Summer (May, Jun, Jul, Aug); F = Fall (Sep, Oct, Nov, Dec).

Workshop Participants

Informational Participants

RESOURCE TEAM 15: Multiple District + University

Team 15 serves a rural/suburban area of 75,000 people in the southeastern United States. Socioeconomic status is mixed; racial composition is 10 percent black, 90 percent white. It is believed that the team has four active members at this time; eleven members were trained originally at the St. Louis ('75) workshop.

The team seems to be failing rapidly. The implementation activities of the team has been fairly extensive, but ceased entirely in Winter 1976:

Summary of Implementation Activities, Team 15

Period	*Individuals Reached*	
	Informationals	*Workshops*
Winter '75	268	25
Summer '75	72	0
Fall '75	115	0
Winter '76	0	30
	455	55

Individual responses to the team questionnaire were generally pessimistic. Two thirds of the items show a team response below the median for study-wide responses, and the majority concurrence for "The team will cease to function next year" is "can't decide." (See page 116 for listings of median responses to the questionnaire).

Team members interviewed directly were even more pessimistic about the team. Some of the comments were: "It is felt that the team will cease to exist after this study." "Future strategies will be to respond to

requests for workshops--the team will not do any volunteering on their own." "Future is empty at this point." "There is very little effectiveness in expanding the team membership."

Some of the causes cited were:

- "The lack of activities is due greatly to the NSF hassle (the funding crisis of the USMES central staff) last year."
- The back-to-basics movement.
- "Leader [a university professor] will be leaving the area."
- Scheduling.
- "Problems with seeing where USMES fits [in a curriculum].
- Lack of USME'S continued support [i.e., central staff support].
- Need for Design Lab help.
- Lack of principal support.
- Great physical distance separating the individual schools of the team.
- An excessive early emphasis on dissemination at the expense of implementation.

Although there can be no doubt that the last three items have had a substantial effect on the team, the fact that the leader will be leaving the area is, in our opinion, a particularly important explanation for why Team 15 should be failing. We feel this problem is serious, since it appears that no one else in the area is prepared to assume leadership of the team.

According to our on-site investigator, the main reason for (the team's) failure is that team members are not doing much USMES and, possibly, are not strong supporters of the USMES program:

> Only [two individuals] indicated that they are doing USMES. The other team members stated, and received the support of their principals in stating, that they would only use USMES when a real problem arose in the classroom.
>
> It is my feeling that either these people will be teaching USMES every day or not at all.... If the teacher is not [sensitive to real problems] there will never be an opportunity to teach USMES.... There was no USMES being taught currently.

Thus, the cause of failure of Team 15 seems to be a relatively simple one, in contrast to some much more complex situations, such as that surrounding Team 7. Apparently members of the team, with the exception of the team leader, who is leaving the area, are no longer strongly interested in USMES.

SUMMARY

Team 15 has a resonably good past record of dissemination activities, but it is not expected to continue functioning after the end of this year. There are a number of contributing factors, but the chief cause of the team's failure is probably that individual members are no longer very interested in USMES, and that the "leader and spark activity" for the team's efforts will be leaving the area soon.

TEAM QUESTIONNAIRE: Median response for team*

TEAM # 15

("Disagree") ("Agree")

1 2 3 4 5

TEAM AND ENVIRONMENT

1. The team's dissemination and implementation goals are . . . realistic — 4.0
2. The resource team is an appropriate mechanism for disseminating and implementing USMES — 4.8
4. There is adequate communication between the team and other school personnel — 3.5
5. The team is . . . able to change its dissemination and implementation strategies to meet the needs of the district(s) — 2.5
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities — 4.0
9. The team effectively utilizes the district resources to disseminate and implement USMES — 3.5
10. The team will [continue] to function next year — 3.2

WITHIN THE TEAM

3. There is adequate communication among team members — 4.8
6. The team effectively utilizes the strengths of the members to achieve its goals — 4.5
7. The team members . . . enjoy working together — 5.0
12. The team members derive personal satisfaction from being part of the team — 4.3

THE USMES PROGRAM

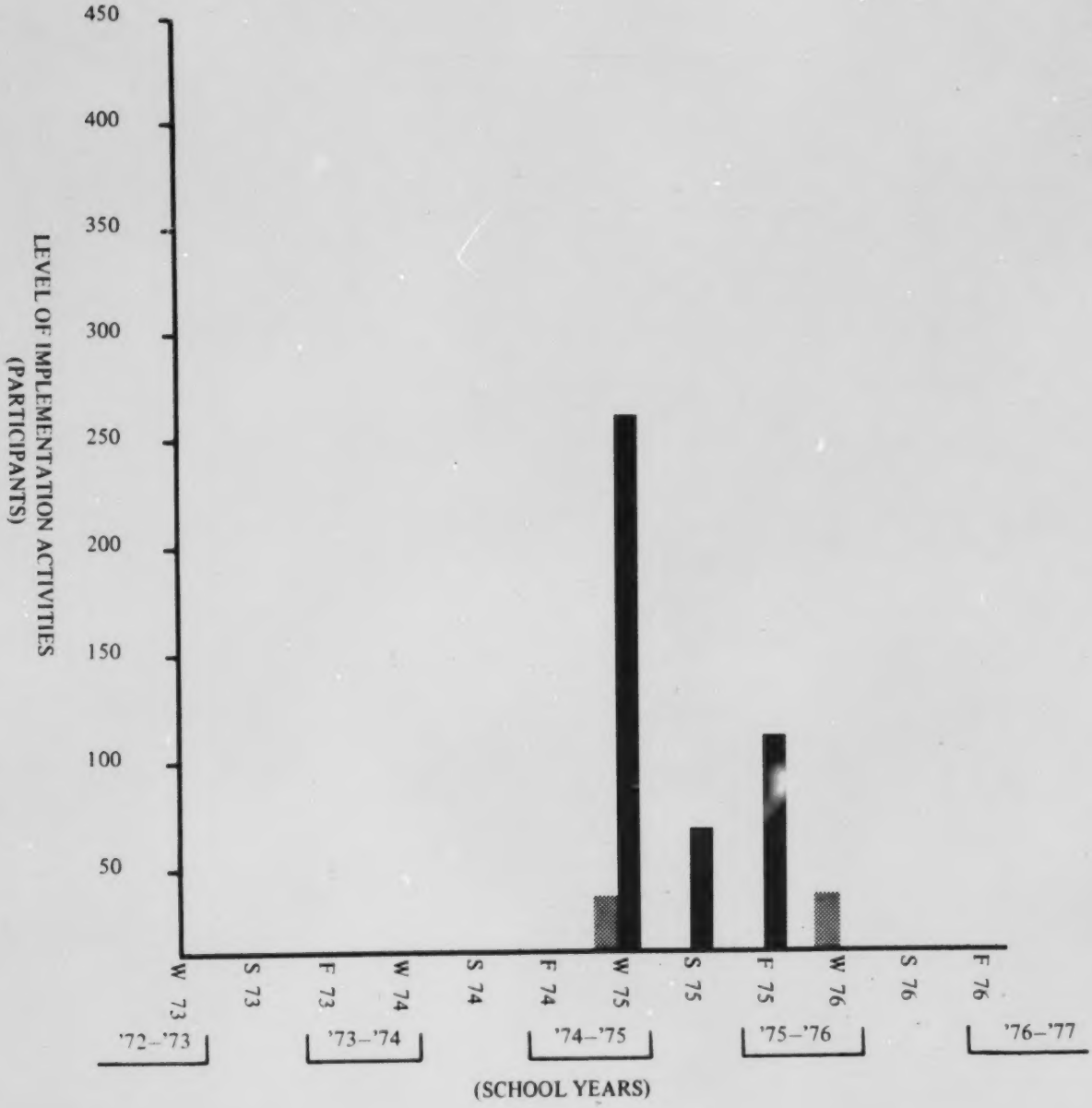
11. The team feels that the USMES approach to teaching and learning is important — 4.0

(Poor . . . . . Good)

Strongly disagree
Mildly disagree
Can't decide
Mildly agree
Strongly agree

*Shading indicates limits of median responses for all the teams in the study

DISPLAY OF IMPLEMENTATION ACTIVITIES, TEAM NUMBER 15



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Workshop Participants
Informational Participants

MAJOR ISSUES

USMES AND THE LOCAL SCHOOL SYSTEM

One of the most critical factors affecting the success of a resource team in a particular environment is the level at which different aspects of the USMES program are administered in that environment. A program that is "enforced from above" on unwilling teachers will not easily become self-sustaining (because of teacher resentment), and may not survive the term of enforcement. At the other extreme, a program that has strong teacher support but lacks involvement from individuals at higher levels within the hierarchy cannot secure proper funding, release time, and so on. If it survives at all, it will continue only in isolated instances where a cooperative principal chooses to give what support he or she can manage without help from the system.

A happy medium is desired, but the balance needed may be different in different environments. In some states, the role of the state legislature is substantial. In California, for example, the legislature, may not be regarded by local school districts as a "real" program at all. In other states the state legislature does not endorse programs and the issue does not arise.

To gather some information about the successes and failures of USMES in dealing with local situations, we asked each team as a part of the team interview, collectively to fill out a decision-making matrix, showing the levels at which decision making occurred locally, both for USMES and for one other program they considered "successful." The form on page 121 was used.

The Appendix gives a complete report of the response of each team. (This data could not be collected from Teams 1 and 6 and so they are missing from this survey.) Tables A and B on page 122 give total figures for USMES and for the other programs with which it was compared.

Looking at the mode values (circled) on Tables A and B, the reader can see that the typical USMES decision-making profile is quite different from that of the other programs selected. Indeed, the differences are sufficiently great that it may be helpful to examine five basic configurations of USMES profiles that appear in the study.

USMES TEAM STUDY: _____

DECISION-MAKING MATRIX

This decision-making matrix is presented in order to determine which groups play major roles in curriculum adoption and implementation in your school district(s).

Please check appropriate boxes: ⌐Governing Processes¬ / ⌐Prime Movers¬	USMES									OTHER CURRICULUM PROGRAM								
	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher	Parents	.			School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher	Parents		.	.
DETERMINING GOALS (establishing or recognizing ultimate objectives):																		
PLANNING (setting forth means to accomplish objectives):																		
PROGRAMMING (determining specific activities):																		
DEVELOPING AND ALLOCATING RESOURCES (financial and human resources necessary):																		
IMPLEMENTING (carrying out objectives):																		
EVALUATING (appraising what is done):																		

TABLE A

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				3		(10)
PLANNING *(setting forth means to accomplish objectives)*				1		(10)
PROGRAMMING *(determining specific activities)*				1		(12)
ALLOCATING RESOURCES *(financial and human resources necessary)*		1	(5)	2	(5)	
IMPLEMENTING *(carrying out objectives)*				1		(12)
EVALUATING *(appraising what is done)*					1	(12)

TABLE B

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	2	1	3	(4)	1	1
PLANNING *(setting forth means to accomplish objectives)*		1	2	(6)	1	7
PROGRAMMING *(determining specific activities)*		1	2	1		(7)
ALLOCATING RESOURCES *(financial and human resources necessary)*	2	3	(7)	1		
IMPLEMENTING *(carrying out objectives)*				3		(9)
EVALUATING *(appraising what is done)*	2		(6)	2	2	

Configuration 1.

Five teams carry out all USMES processes, except allocating resources, at the classroom level. Resource allocation takes place at the building level.

CONFIGURATION 1: Five Teams

DECISION-MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*						X
PLANNING *(setting forth means to accomplish objectives)*						X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*					X	
IMPLEMENTING *(carrying out objectives)*						X
EVALUATING *(appraising what is done)*						X

Teams with this arrangement either fail (the probable outcome for Teams 4,8, and 15) or succeed in establishing a single-school implementation but fail to proliferate (the case with Teams 10 and 12). The richness of a single-school implementation under Configuration 1 may be great, but proliferation is not likely.

In any given case, the causal relationship between a team's degree of success and its decision-making profile may not be clear. Configuration 1, for example, may be symptomatic of a demonstration-school strategy

(Team 10); it may reflect an early partial failure, which has been followed by a demonstration-school strategy (Team 12); or it may result from more or less complete failures of other strategies, leaving implementation that have become isolated and now appear as Configuration 1 (Team 4).

Configuration 2.

For one team (Team 11), all processes except allocating resources occur at the classroom level; allocation is carried out at the school board level.

CONFIGURATION 2: One Team

DECISION-MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*						X
PLANNING *(setting forth means to accomplish objectives)*						X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*		X				
IMPLEMENTING *(carrying out objectives)*						X
EVALUATING *(appraising what is done)*						X

It is, of course, impossible to generalize from a single team. However, we would expect a team with this configuration to have considerable strength, but to spread rather slowly, since there is no involvement at either the central administration or curriculum specialist levels.

Configuration 3.

Four teams in this study are operating in the decision-making environment shown below.

CONFIGURATION 3: Four Teams

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				(X)		X
PLANNING *(setting forth means to accomplish objectives)*						X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*			X			
IMPLEMENTING *(carrying out objectives)*						X
EVALUATING *(appraising what is done)*					(X)	X

Configuration 3 is equivocal. With the central administration responsible for allocating resources, local implementations are likely to be sound and to permit proliferation (unlike those under Configuration 1), but they are not strong enough to resist other unfavorable factors. This implementation process does not involve curriculum specialists and building principals to any degree; thus, it does not secure their support through personal involvement. At the same time, support does not come at a high enough level (school board or state legislature) to constitute a mandate that will be effective regardless of the degree of personal involvement among curriculum specialist and building principals. Generally, a team showing Configuration 3 cannot prevail if an outside entity that is not involved with USMES (state legislature or local science curriculum committee, for example) is influential. However, it can prevail if outside support such as a grant is forthcoming, and if one or two deviations from the configuration (shown as (X) on the table) involving either principals or curriculum specialists are present.

For example, Team 9, which is operating in the presence of a powerful state legislature that does not mandate USMES, is not succeeding. The other program, however, has strong legislative support.

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	O					X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*	O		X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*	O					X

On the other hand, Teams 3 and 14 deviate slightly from the basic configuration and are succeeding. Both have received help that is not shown on the matrix: In one case there is a foundation grant, and in the other the team leader is a member of the state department of education. Also, Team 14 has principal involvement in evaluation and Team 3 has curriculum specialist involvement in determing goals.

Configuration 4.

Team 2 shows the following configuration.

CONFIGURATION 4: One Team

DECISION-MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				X		
PLANNING *(setting forth means to accomplish objectives)*				X		
PROGRAMMING *(determining specific activities)*				X		
ALLOCATING RESOURCES *(financial and human resources necessary)*				X		
IMPLEMENTING *(carrying out objectives)*				X		
EVALUATING *(appraising what is done)*						X

Team 2 (the team shown above) has been very successful, presumably because there is wholesale involvement at the curriculum specialist level, and curriculum specialists not only can but do allocate resources for the program.

Configuration 5.

Team 7 shows the following configuration.

CONFIGURATION 5: One Team

DECISION-MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				XO		
PLANNING *(setting forth means to accomplish objectives)*				XO		
PROGRAMMING *(determining specific activities)*				O		X
ALLOCATING RESOURCES *(financial and human resources necessary)*		O		X		
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*				O		X

It is not certain that the situation shown above is closely connected with the problems Team 7 has experienced, but it is possible to speculate what sort of problems might arise from this configuration. In general, depending on the curriculum specialist to allocate resources to a program that he or she neither programs nor evaluates (this is not the case with the other program) seems undesirable. USMES is not competing successfully with the other program for the involvement of curriculum specialists, yet it depends on those same specialists to find funds. No doubt Configuration 5 arose in a climate where outside funds were freely available to Team 7.

SUMMARY

Of five ways in which the basic governing processes (determining goals, planning, programming, allocating resources, implementing, and evaluating) are configured in USMES programs among the fifteen teams in the study, only two, Configuration 1 and Configuration 4, appear more than once.

Configuration 1, which appears in five teams, is sometimes successful, but often nonproliferative. Configuration 3 which appears in four teams, may be either successful or not, depending on influences outside the school system.

THE TEAM LEADER

One of the most interesting findings of this study is that the career role of the resource team leader is a very important influence on the success of the team. The roles we shall consider are classroom teachers, university professors, building principals, and officials (administrators and professional specialists) in the local or state educational hierarchy.

Classroom Teachers

Five teams in the study are led by classroom teachers. In general, our on-site investigators found that team leadership was difficult for classroom teachers. Comments such as, "it is hard to lead with no real authority" were typical of this group. The difficulty seems to make itself felt even when an individual classroom teacher is capable and energetic. In concrete terms, some of the difficulties encountered are these:

- It is often difficult for classroom teachers, who have little authority over resource allocation, to control the funding of USMES activities adequately.

- It is potentially difficult for the classroom teacher to secure enough release time to carry out necessary classroom visits and provide adequate follow-up assistance to locally trained USMES teachers.

- The hierarchical distance between the classroom teacher and the district's decision makers is too great. Thus, it is somewhat difficult for the classroom teacher to be an effective advocate for USMES in his or her district.

- It is more difficult for classroom teachers than for high level or specialist school system officials to secure the cooperation of building principals for supporting teachers who use USMES in the classroom or for promoting increased use of USMES in their schools.

On the other hand, classroom teachers have been quite effective, especially in certain unusually difficult situations, in preserving the resource teams they lead despite funding difficulties or other problems of a temporary nature. For example, the leader of Team 5 was able to renew her team completely by training replacement members locally after the original team disbanded. However, the team's survival is still in doubt, because of local problems at its host school; and no attempts have yet been made to spread USMES beyond the boundaries of this school. Furthermore, team members are not yet thinking of spreading USMES beyond their own classrooms. If a phase of broader dissemination effort ensues, the leader of Team 5 may encounter more concrete limitation imposed by her role of classroom teacher.

Team 8 is presently held together by a classroom teacher who is facing severe problems resulting from the administrative structure of the host district. This structure allows no platform below the level of the school board from which USMES can be promoted in a positive way, because of potential rivalries between separate administrative areas within the district. The leader can, in her role as classroom teacher, maintain existing activities of the team at a certain level, even if she cannot transcend area rivalries.

Team 11, which is located at a university lab school, has a lab school teacher as team leader. In this instance, which admittedly is a special case, our on-site investigator has encountered no evidence of difficulty. In fact, it seems that it may be preferable to employ a lab school teacher in this role rather than the lab school director, which was previously the case. This team's experience suggests that a director can come under pressure to promote programs that emphasize basic skills in traditional ways rather than through innovative programs, and so might be poorly situated to act as a strong advocate for USMES.

Team 13 may suffer less than other teams in the future from having a classroom teacher as its leader, because that teacher has received a district-level appointment as a part-time USMES coordinator and is now authorized to promote USMES at all levels within the district. His role as classroom teacher may not hinder him significantly, so long as he is a part-time USMES coordinator.

There are situations (Team 3 is a good example) in which a classroom teacher functioning as leader (or, in the case of Team 3, administrative coordinator) is wholly effective: just those cases where the teacher is largely free to concentrate on USMES, because of a full-time job or a great deal of release time, and is thereby "legitimized" as a person who may work throughout a district, or even beyond district boundaries.

University Professors

Several teams in the study are led by university professors. In general, this arrangement has proved to be unsatisfactory, particularly since federal government funds for large workshops and other relatively ambitious training activities (which university personnel have been effective in securing) have become largely unavailable. The problem, broadly stated, is a lack of overlap between the legitimate career interests of university personnel and the most pressing needs of USMES resource teams. Conducting locally funded workshops, making local presentations and classroom follow-up visits to team-trained USMES teachers, and administering the resource team activity efforts are generally not considered in tenure determinations; neither are they particularly helpful for further professional advancement of tenured faculty, nor do they provide consulting fees or summer salary. Thus, team leaders who are university faculty members must "find time" to carry on the daily activities of team leadership, while independently pursuing their academic careers.

It is not a matter of university personnel "not caring" about the success of their resource teams, nor of "poor communications" between university team leaders and their non university team members. University personnel in this study seemed in every case to feel real concern for the success of their USMES programs. Furthermore, in only one instance does any but the most cordial relationship exist between university-based leaders and their teams. Nonetheless, it appears that university personnel, despite all good intentions, are unable to devote a sufficient time to the routine but important activities of team maintenance.

Building Principals

For two teams, a building principal is team or team-component leader. In both instances, the teams are thriving within the limits of the leader's own school. However, in neither case is there evidence of much proliferation to other schools. Since the team leader is a building principal, it is inevitable that there should be strong support for USMES teachers within his or her school, and that resources that can be allocated by the building principal will be made available for USMES teachers. It is natural for a building principal to concentrate on strengthening USMES within his or her own school, rather than on spreading USMES to other schools. Furthermore, there is always the possibility of rivalry between the team leader and principals of other schools, which might retard USMES dissemination.

The demonstration-school strategy, which entails the idea that USMES can be disseminated by creating a particularly effective one-school program as an "advertisement" for USMES, is the most natural strategy

to use if the leader is a building principal. Particularly in the case of Team 10, the result is a rich, brilliant, single-school implementation of USMES. However, the strength of such an implementation may not lead to USMES funding at high levels in the local school system. Indeed, it can be argued that higher-level funding is more difficult to promote in the presence of a strong demonstration that an effective USMES program is possible without external funding. Unfortunately, a one-school USMES program of this kind is not possible without the strong personal support and leadership of a building principal who fully understands USMES.

Administrative Officials and Specialists

Perhaps the best career roles for USMES resource team leaders are administrative officials or specialists within a state or local school system. In general, such officials have sufficient authority and independence to allocate the funds needed for systematic USMES implementation and to serve as effective advocates for USMES in a broader context. The most successful teams studied have either been led by such officials or have been significantly aided by such officials at a higher level (Team 14).

Inevitably, such teams get off to a strong start. Adequate funding and structures for dissemination and follow-up are provided from the first. Furthermore, a team leader who is already involved in the administration or some other curriculum program sometimes fosters a "symbiotic relationship" between that program and USMES, to the mutual improvement of both programs. This facilitates the rapid early dissemination of USMES, since it benefits from delivery systems that are already in place when USMES is introduced.

If anything is to be said against the use of such administrators and specialists as team leaders, it is the difficulty of program survival in the event that such leaders relinquish active control due to retirement, promotions, or the press of other duties. Some of the difficulties that actually arose in the teams studied are:

- When the able and effective leader of Team 1 retired, the mantle of team leader fell upon his successor in the local school system, an individual who, far from being a strong advocate of USMES, had serious reservations about the program. This created a serious organizational problem for the team. This problem was finally solved when, by great good luck, a local college set up a program of in-service training for local teachers that, coordinated by the original leader of Team 1, could guide the training activities of the team.

- When the leader of Team 3, a district curriculum coordinator, wished to relinquish active leadership of the team, a "leadership vacuum" ensued. Plans set in motion by this leader were not taken up effectively by the remaining team members, and funds secured by her were not expended by the team. The leadership vacuum was not really cured until a private foundation grant made it possible to hire a full-time USMES coordinator (a classroom teacher) to direct the team.

- Team 7, after a strong start under the leadership of a member of the central district administration, has now largely abandoned USMES. The exact reasons are not clear, but it appears that the team leader is now inactive in her role of coordinating the team. Now that she has been credited with the early success of the team, neither she nor anyone else wishes to continue with the routine task of supervision.

The only teams in the study that are led by a school system administrator or specialist and have avoided problems such as those just described are Teams 2 and 14, in which no change of leadership has taken place, and Team 6, which is still in its initial stages. On the other hand, of all such teams, only Team 7 has been lost or seriously damaged. In this case, the leader kept nominal control while relinquishing active supervision.

SUMMARY

Classroom teachers are effective in holding together a team during periods of adversity, when little funding or support is available. But they operate at a serious disadvantage in promoting USMES or carrying out classroom follow-up visits to locally trained teachers, if it is necessary to cross school boundaries or to find support from administrators high in their own school system. This objection does not apply where teachers have release time, or special jobs, which allow them to act chiefly as USMES coordinators.

University professors are effective in conducting large, federally funded, workshops or training programs, which are sufficiently elaborate to advance their professional careers. They are, however, relatively ineffective in carrying out the day-to-day supervisory activities necessary to support a resource team on a continuing basis.

Building principals are ideal team leaders where a demonstration-school strategy of implementation and dissemination is employed. In other cases, however, they are not as effective as other candidates, since the leadership opportunities and fund-allocation responsibilities of building principals tend to create demonstration-school implementations regardless of what strategy is attempted.

Administrative officials or specialists in state or local school systems probably make the best team leaders. The chief problem (and it is a real problem) is that once a team has become successful under such a leader, it is difficult, even with the active cooperation of that leader, to shift leadership responsibility to anyone else. Nevertheless, this problem can be overcome and, in our view, does not outweigh the benefits of having such individuals as team leaders.

CENTRAL OFFICE SUPPORT FOLLOWING NATIONAL WORKSHOP TRAINING

One function of the USMES central staff, particularly during an early stage of the USMES project, has been to provide follow-up support to resource teams trained at national workshops. In general, this support has been moderate in amount and beneficial in effect, though it has not materially altered the directions in which the resource teams have developed following workshop training.

In a few cases, teams made reference to USMES central office support during the interviews conducted for this study. Team members stated that central office support was either lacking or particularly helpful.

Three teams cited lack of central office support, as a problem. Naturally, this sort of observation is of considerable interest to members of the USMES central staff, and to others who might consider setting up a program employing a resource team network, since the appropriate funding level for follow-up assistance to resource teams is at issue.

The three teams present a mixed picture. It is possible, in the case of Team 15, that too little central staff support was in fact provided. It is likely that Team 15 would have been much more successful if it had consolidated its own members' USMES teaching to a greater degree before attempting to spread USMES to other teachers. Presumably, with more extensive contact between central staff and Team 15, a different and more effective strategy would have been followed. On the other hand, Team 15 is one of the least successful of all the teams studied and has been beset by problems that might have caused it to fail in any case.

Another team that cited lack of central office support is Team 14. This, however, is probably a reflection of a specific period in the life of the USMES project, during which contact between central staff members and resource teams in the field was grossly curtailed by abrupt changes in National Science Foundation policy. It should be noted that Team 14, despite this problem, has become a very successful team.

Team 8 is a special case. An unusual amount of central office support was required and provided early in the life of this team, because the team encountered difficulties fixing upon an effective organizational structure in a complex political situation. Early central office assistance provided a form of leadership, designed to give Team 8 a voice capable of transcending administrative area boundaries in its home district. In hindsight, the central office staff feels this sort of intervention was unavoidable. However, it had the unfortunate effect of preventing Team 8 from evolving a leadership structure independent of the USMES central staff. Accordingly, when central staff assistance diminished, Team 8 felt the lack. It is probably more accurate to regard the team members' comments as symptomatic of too much early support rather than of too little support overall.

The two "symbiotic" teams in this study, Team 1 and Team 6, received and acknowledged an unusually large amount of central office support on an "as needed" basis. In both cases, due to the complexity of the implementation structures that were being evolved, this support was probably necessary. In both cases, too, in view of the broad dissemination of the USMES program effected, it would appear that central staff support was profitably employed.

SUMMARY

This study does not indicate that the basic level of follow-up support from the USMES central staff to trained resource teams in the field was significantly too low. In two cases it appears that support was lacking to some degree, but in neither case (in our judgment) was the ultimate outcome materially affected. On the other hand, it is our view that central office support for the project was not set at too high a level either. In particular, the ability of the USMES central staff to give special, immediate assistance as needed to Teams 1 and 6, the symbiotic teams, yielded major rewards in terms of cost-effective implementation of USMES over a large target population. This sort of occasional continuing support, afforded to teams on an "as needed" basis, seems to have been especially effective, and to be the method of choice for future programs.

CHANGES IN RESOURCE TEAM MEMBERSHIP

Resource teams are often required to change their membership significantly as time passes. Probably the three most common reasons to change membership are local increases in the number of team-trained USMES teachers, changes in team goals or structure, and member attrition.

Local Increase in the Number of Team-trained USMES Teachers

If a team is to continue to function effectively, both in implementation and follow-up activities, it must be sensitive to the needs of new, locally trained USMES teachers. One way a team can increase its sensitivity to these needs is to include a number of these newly trained teachers in its membership. Characteristically, teams employing a demonstration-school strategy include all locally trained personnel in their teams. This is particularly easy and appropriate, since new members and original members are generally at a single building location. Under these circumstances, it is easy for experienced members to provide full and continuing training to new members. In general, this method has been followed by Teams 5, 10, and 12. It is also nominally employed by Team 3--that is, all USMES trained teachers in the area (about 50) are regarded as members of the team. However, because Team 3 is supported by a private foundation grant that provides for a full-time salaried USMES coordinator, the inclusion of all USMES teachers effectively places the leadership of the team in the hands of this full-time coordinator and project administrators.

A somewhat different solution has been employed by Team 2 and to a certain extent by other teams. It entails the use of a steering committee, consisting of original team members and representatives from the schools where USMES is being taught. In this way, a team structure evolves that is sensitive to the particular needs of individual implementation sites and yet is not so large as to be unwieldy. In general, unless a demonstration-school strategy or symbiotic implementation is involved, this method is recommended by central staff members.

Changes in Team Goals or Structure

Another development that frequently affects team membership is change in the model or in the administrative structure of the team. The clearest example of this phenomenon is Team 3, where a private foundation grant precipitated a number of changes in the structure of the team. A university professor assumed his role as project director; a full-time USMES coordinator was hired to function as administrator for the daily activities of the team; team membership shifted, (in numbers), toward secondary school personnel, and away from elementary school personnel, as a result of the grant, which was issued to develop a strong secondary real-problem-solving curriculum. There is some indication that the original members of the team have lost some of their influence on team policy as a result of this change, but the net effect appears to be positive.

In at least two other teams in this study, major team reorganizations were precipitated when the terms of the USMES project grant funded by the National Science Foundation changed, putting pressure on local teams to merge and form new regional teams. In both cases where a major team restructuring resulted, Teams 4 and 9, serious problems ensued. In both instances our on-site investigators now recommend that hiring a full-time USMES coordinator, if funds could be found, might solve the problem. In neither case, however, has a full-time coordinator been employed.

Attrition of the Original Team

In several instances, attrition among original team members has been the result of defection among members who were, from the start, philosophically unsympathetic with USMES (Teams 7 and 11). In other cases (Team 5, for example) this has been due to conflicts of various sorts.

Where an attempt has been made to rectify, rather than merely to tolerate, such attrition, it has been through local training of new personnel. Particularly in the case of Team 5, which now includes only one originally-trained member, this measure has worked very well.

SUMMARY

The three most common sources of pressure upon resource teams to change their membership are an increase in the number of local USMES sites, which triggers a need to include new teachers on the team; changes in team goals or structure that require special coordinating efforts, and attrition, which requires local training of new members.

MOTIVATIONS FOR LOCAL ADOPTION OF USMES

One of the most interesting issues in the study of any local resource team is why local personnel have been moved to constitute themselves into such a team and to seek training. It is understandable that the motivation to form a local resource team should have a profound effect on the ultimate success or failure of that team. For example, if the formation of a particular team is motivated by the desire to arrive at some goal that cannot in fact be reached, the raison d'etre of that team will disappear as soon as it is known that the goal cannot be realized. Likewise, if the motivation for forming a particular team is not wholly compatible with the widespread dissemination and implementation of USMES, that team, however well it serves the end to which it was introduced, cannot be wholly successful from the point of view of the USMES central staff.

It would certainly be desirable to assess the motivations that led to the introduction of USMES by each team in this study. Unfortunately, these motivations are often unstated. Many teams cite as their ultimate goal "the dissemination of the USMES curriculum to as many schools and teachers as possible." The actual motives of team members who say such things may range from the ideological (they believe the USMES philosophy of teaching and learning should be promulgated), to the opportunistic (funds were available), to the honorably ambitious (someone desires to introduce a generally valuable and beneficial program and also to advance his or her career). The present study is not the place to distinguish among these possibilities.

On the other hand, a number of individuals gave more personal reasons for their interest in USMES. Among these were the belief that USMES would aid in staff development and improve student attitudes; the belief that USMES was consistent with their local district's philosophy of education; the desire to implement some real-problem-solving curriculum (not necessarily USMES); solicitation from USMES central staff; and the need of an already funded program for a real-problem-solving component, which USMES could provide.

Staff Development/Student Attitude Improvement

Three teams were formed specifically for the purpose of staff development and student attitude improvement. Team 3 was put together by a district curriculum coordinator, in part to introduce USMES as a significant alternative for elementary school instruction, but chiefly to promote staff development in her district. One of the most active members of Team 12, a building principal, wished to use USMES for staff development and to improve the attitude of the students in his building. Team 14 was promoted by the state department of education official now serving as state USMES coordinator for the rather sophisticated purpose of improving his area's staff development dissemination system.

In all three cases, it appears that significant progress has been made toward meeting local goals. Insofar as these goals are consistent with USMES dissemination and implementation, the associated teams have been successful resource teams. As one would expect, the statewide goal of the USMES coordinator supervising Team 14 has educed a stronger USMES implementation and dissemination effort than the consciously limited goals of the building principal in Team 12. In all cases, however, results have been good.

Local Educational Philosophy

In at least three cases in the study, USMES was introduced because it would help to implement an existing educational philosophy in the district. Here, results range from very good to surprisingly bad.

Team 2, where the USMES philosophy was perceived as consistent with that of the local district, is one of the more successful teams in the study. USMES implementation has proceeded in a consistent manner, and all buildings in the district now have USMES teachers. On the other hand, both Teams 5 and 11 were formed because building principals believed that the philosophy of USMES was consistent with that of their recognizedly innovative schools. In both cases, conflicts have arisen over the degree of innovation to be used at the schools, and USMES team members question the sincerity of the building principal's commitment to USMES. Team 5, in particular, has undergone a very bitter time, in which all but one member have quit the team and new members have had to be trained locally. Whether the contrast between Team 2 on the one hand, and Teams 11 and 5 on the other, is due to the scope of the implementation (Team 2 is district wide, Team 5 is in a single "model school," and Team 11 is a university lab school), or due to the leader's degree of commitment to USMES is difficult to determine. However, it seems safe to suggest that USMES will be more successful in areas whose educational philosophies are compatible with USMES than in areas where USMES represents a fashionable educational trend.

USMES as a Variety of Real-Problem-Solving Curriculum

In at least two cases, USMES was introduced locally because it was an instance of a real-problem-solving program, and a local need for some program of this type was felt. In one recent case, a new component was formed under Team 1 (Department of Humanities and the Arts), because the director of the department saw a need to familiarize her staff with the technique of real problem solving. However, since the technique of real problem solving she envisioned at first was very different from USMES, this endeavor has met with limited success so far. In another instance, Team 9, a group of individuals saw a need for "interdisciplinary real problem-solving. They attended the St. Louis ('75) workshop, and returned still convinced of the value of real problem solving but skeptical about the USMES program per se. Subsequently, the team has promoted interdisciplinary real problem solving, but the results have not been entirely satisfactory.

Solicitation by USMES Central Staff

In at least two cases, Team 8 and the university component of Team 12, a local USMES resource team was formed in response to a solicitation for workshop participants by the USMES central staff. Although the results were to some extent good, the ultimate quality of the local implementation effort seems to have been hindered in both cases because the resource teams were not organized around a local initiative. Hence, the teams were not adapted as well to local political conditions as they might have been.

Team 8 required extensive assistance, both financial and personal, from the USMES central staff early in its history; this assistance perpetuated a situation where the organization of the team was based on the initiative of an outside agency. Team 12 has met with moderate success, but the relationship between the components of this team seems to be anomalous, and "communication is poor" between the university and district components.

These two cases suggest that solicitation of participants by central office staff members is not the best possible basis for forming local resource teams.

Fulfilling Needs in Existing Programs

Two teams in this study, Team 1 and Team 6, were instituted to meet the needs of existing curriculum programs. Since the purpose was to supplement and complement programs already being delivered, the relationship between USMES and the "host" program can fairly be called symbiotic. Since a structural organization, a delivery system, and a more or less clearly defined target population is likely to exist in such instances, a symbiotic implementation of USMES can be cost effective. This notion is corroborated by the considerable success (to date) of Teams 1 and 6.

SUMMARY

Where a specific motivation to form a resource team (aside from the desire to implement USMES throughout a certain area) is stated, responses fall into five main groups:

- Staff development and improvement of student attitude.
- Implementation of a local educational philosophy.
- Provision of some type of real-problem-solving curriculum.
- Response to USMES central staff solicitation.
- Support of an already existing program in a symbiotic manner.

Results are characteristically good when the motivation is staff development, student attitude improvement or symbiosis. Implementing a local educational philosophy has good results if the prevailing climate of thought is favorable to USMES, or if the local education agency is deeply committed to the educational philosophy incorporated in the program. Provision of USMES as a type of real-problem-solving curriculum does not necessarily yield good results, since equating USMES with the generalized philosophy of "interdisciplinary real problem solving" may lead to the adoption of USMES where a different program is needed. This results in poor implementation and dissemination of USMES. Finally, if there is no strong local impetus for USMES, but only receptivity to solicitation from the USMES central staff, the local organizational structure may be too weak to sustain USMES once central office support is diminished or withdrawn.

EXTENSIONS OF USMES

When a program such as USMES is implemented in the field, the original qualities of that program are frequently altered and extended in local implementation. Among the 15 teams studied, five main types of extensions to USMES have been observed:

1. A number of teams have developed hybrid programs in which USMES is combined with a specific curriculum subject, such as USMES and consumer education or USMES and career education.

2. In at least two cases, USMES has been employed as an administrative tool to aid in helping a school run smoothly or to solve a particular problem within the school.

3. In one case, an extensive effort has been mounted to develop USMES into a secondary school curriculum.

4. In at least two cases, USMES has been adapted for special types of students (gifted students).

5. In one instance (Team 6), a speciál introductory category of USMES challenge, the "mini-challenge," is being developed.

Combinations of USMES With Other Curriculum Subjects

USMES, broadly understood, may be combined with any subject matter, since none is, by its nature, inherently unsuitable as the subject of an USMES challenge. In at least three cases, individual teams have developed or are developing overt combinations, specifically uniting USMES and some other subject such as career education or consumer education. These overt combinations of USMES with other materials may be used at various levels in a team's implementation effort. For example, Team 1 has submitted grant proposals to develop career education USMES and consumer education USMES programs. Team 2 has incorporated a career education USMES hybrid at the district level as

an alternative curriculum module for optional use by district teachers. Team 6 employs various mixed topics of current interest such as "USMES and Basic Skills," "USMES and the Environment," "USMES and the Urban School," "USMES and Assessment," "USMES and Humanistic Education," as subjects for treatment in its introductory awareness workshops, given to prospective USMES workshop participants.

USMES as an Administrative Technique

In at least two instances, USMES has been employed not only as a curriculum item, but as a tool for assisting in the internal administration of an implementing school.

In the "host" school case of Team 10, many routine housekeeping tasks necessary to the functioning of the school have been taken over and are currently administered by students as USMES challenges. This combination of real-problem-solving activity and administrative service is seen as improving the school as a whole and increasing the acceptability of USMES to schools, students, and teachers. The issue of using USMES as an administrative tool in this fashion is an interesting and perplexing one. It can be argued, quite convincingly, that making such use of the program increases its attractiveness, usefulness, visibility, and cost-effectiveness. Certainly, in the case of Team 10, it has resulted in a brilliant, highly visible USMES program.

Nevertheless, this sort of extension of the basic USMES framework is not without cost. First, it would appear that, where housekeeping problems are "solved", students spend a disproportionately great amount of time implementing solutions, and a small amount actually conducting problem-solving activities. Consequently, it might be argued that focusing real-problem-solving challenges on such problems attenuates the instructive experience of the USMES program. Also, it might be argued that starting USMES teachers with locally devised challenges (and many of Team 10's USMES teachers are new) deprives teachers of the learning experience of working with carefully prepared, fully tested, well-documented "standard" challenges. Thus, we regard with reservation the brilliant extension to USMES practiced by Team 10.

Team 5 is taking an active part in the struggle of its host school to maintain an innovative posture, by convincing both parents and the principal that order can be maintained in the school without a "tighter" structure. To this end, a two-tiered USMES program has been instituted: Regular USMES classroom challenges are guided by individual teachers, while challenges related to school-wide matters such as discipline, safety, and playground problems are pursued by the school at large.

Challenges of the second type are similar to many of those pursued by Team 10. However, they differ in that they are problematic rather than tasks requiring attention. Of course, their problematic nature may make them either more or less effective. They may be effective because they are perceived by students as "real" problems, not merely duties; on the other hand, the difficulty of these problems (they have, so far, eluded solution even by the USMES teachers of the host school) is such that they may simply be too hard to solve, in which case they have little value as educational experiences.

The most important thing to remember about the extensions to USMES as practiced by both teams is that they are positively adaptive. The administratively conceived use of USMES by Team 5 may save that team; the keen interest and spirit produced by the USMES adaptations of Team 10 are highly desirable in themselves, and constitute as well an outstanding demonstration of Team 10's brand of USMES. For the schools involved, whatever their relationship to "classical" USMES may be, the results have been positive.

USMES for Secondary School Classes

Team 3, aided by a three-year private foundation grant, is engaged in the most massive extension to USMES encountered in this study: Its extension to secondary schools. It is too soon to know how successful the team will be in producing a secondary school USMES program. However, it is clear that Team 3, by proposing to develop such a program, has considerably broadened its potential funding base. Also, it is very desirable that a local resource team should be able to attract private foundation funds for the purpose of developing an entirely new variety of USMES. This represents, perhaps, one of the most successful possible outgrowths of the resource team program.

USMES with Special Groups

At least two teams have tried to implement USMES with a particular group of students. For Team 2, this effort is only beginning; now that all initial goals have been achieved, a new goal is "to seek support in using USMES for the 'high potential' student." With Team 14 the process is far more advanced. The teachers of talented and gifted students in that team area form a sub population in which USMES implementation has taken place at an accelerated rate. In fact, at least 12 separate buildings presently use USMES for talented and gifted students.

Other teams in the study have spoken of promoting USMES implementations among special groups, such as gifted or retarded students. In most

cases, however, the underlying intent appears to be securing stronger funding or a more sympathetic hearing in a district where "standard" USMES is not being strongly supported, rather than a conceptual change or expansion in USMES.

USMES Mini-Challenges

One interesting innovation taking place in Team 3, and among teams supported by Team 6, is the concept of USMES mini-challenges as a device for familiarizing teachers and students alike with the nature of USMES activity. The idea underlying the mini-challenge is that both students and teachers can become comfortable with the idea of USMES more easily if they know their first experience will be a short, easy, trial challenge.

The use of mini-challenges in the classroom is an interesting departure from the basic view of USMES held by most central staff personnel. They feel that, first of all, USMES problems should be real problems of significant scope and there is some doubt that introductory mini-challenges will meet this criterion. It is also felt that the quick closure necessary in mini-challenges may undermine standards of thoroughness. Nevertheless, the idea is an interesting one, and some central staff personnel, (including the on-site investigator for Team 6, but not the investigator for Team 3) think it may be a sound device for ultimately involving more teachers in challenges of standard length.

SUMMARY

In general, extensions to USMES developed by the individual teams have been positive in effect. Incorporating particular curriculum fields such as career education, or consumer education into USMES programs appears to be a useful and legitimate way of justifying the award of federal grants for USMES efforts in these areas. Such incorporation gives USMES a clear and classifiable role in district curriculum plans, and provides prospective USMES teachers with a concrete idea of curriculum areas that may be served through USMES.

As an administrative tool (that is, as an aid in running elementary schools more smoothly) USMES is evidently quite effective, and represents a very successful and well-adapted extension of the USMES program to local conditions. A certain anxiety among central staff members about USMES being adapted to wholly "social" purposes suggests that the adaptation may not be without cost; however, the overall result seems to be quite good.

The extension of USMES to deal with real problems in secondary schools is a major developmental advance. The process is well underway with Team 2, aided by a private foundation grant.

Adapting USMES for special groups, such as gifted or retarded students, has been carried out with good success by Team 14, and is contemplated by Team 2. Probably it should not be used merely to secure local funds and support that is otherwise not forthcoming, since USMES was developed for an average student population.

Mini-challenges have been employed by Teams 3 and 6 to introduce USMES to cautious or dubious teachers. It is too early to tell how well this extension to USMES will work.

CHANGES IN TEAMS DUE TO PHILOSOPHICAL CLIMATE AND AVAILABILITY OF FUNDS

In recent years, both the philosophical climate in education and the availability of local and national funds for innovative educational programs have changed markedly. At certain sites, the conditions under which an USMES program was begun have proved to be very different from those prevailing at later stages. Accordingly, some teams formed in one climate have had to adapt to another. Some of the factors that have changed most drastically, and some of the adaptive changes instituted by teams in this study, are discussed briefly below.

Back-to-Basics Movement

Probably there is not a team in this study whose members did not repeatedly cite one trend of thought in educational circles, the back-to-basics movement, as a major problem impeding team implementation efforts. Back-to-basics is almost certainly the worst single problem to face USMES implementation teams over the past months.

Its effects may be subtle or direct. Most directly, funds are simply made unavailable for use by innovative programs within a particular district. At a further remove, any of the following may take place:

- Principal support may be drastically weakened. Principals who are under pressure to stress instruction in basic skills may be notably unwilling (or indeed unable) to give USMES team members and locally trained USMES teachers the support they need to proceed effectively. It should be emphasized that support in this sense is not simply a matter of funds, or a matter of positive reinforcement and approval. A successful USMES teacher must have the support of a principal, and a reasonably cooperative attitude on the part of peer teachers, for a number of practical reasons: Building resources must to some extent be shared; USMES challenges may be more difficult than other activities to classify as curriculum items; and successful USMES challenges often result in increased noise levels and other "disturbing" effects.

- In some instances record-keeping procedures have become far more elaborate than formerly. For one team in the study, the difficulty encountered by local teachers in representing their USMES work accurately in their record-keeping activities was cited as one of the most critical handicaps under which the local implementation and dissemination effort was laboring.

- In one case, a district's recognized "model school," a school of innovative character, became the host school for a resource team. Subsequently, in response to rising parental pressure that basic skills be taught in the traditional manner, the actual innovative character of the model school itself, and with it the school's USMES program, has come to be threatened.

Diminishing Availability of Funds

Another change noted by almost all teams studied was that funds, both at district and at higher levels, had become less available with time. Of course, the chief effect of this change has been to retard USMES implementation and dissemination efforts generally among all teams. In addition, two specific problems have emerged as a result of the overall change in the availability of funds. First, team leadership by university faculty members has become less satisfactory for teams and faculty members alike. As noted earlier, resource teams have been less able to offer the type of activities that make use of the individual faculty members' training and experience, and are, at the same time, relevant and useful to his or her career.

Teacher Disenchantment with Inservice Training

In three cases, resource team members complained of general disenchantment among teachers with inservice training programs. There would seem to be two explanations:

- The relative unpopularity of inservice training may be merely a symptom of the general unpopularity of training in innovative educational techniques, and not applicable to all inservice training.

- Stringent hiring practices in recent years have tended to exclude newly-trained teachers, who have the strongest interest in inservice training as a means to earn salary increments. Relatively experienced teachers working in the schools have, by and large, less incentive to seek inservice training.

However, a shift away from the use of inservice training by USMES teams is not recommended, especially since many colleges and universities, in the face of growing underemployment among newly trained teachers, are beginning to divert their resources away from (possibly futile) preservice training and toward inservice training.

Termination of the USMES Program

Two teams cited as a significant hindrance the problem of being associated with "a discredited program." The USMES program passed through a crisis of funding in Spring 1976. During this period, contact with teams was lost because of NSF policy changes, and it appeared that the project might be terminated abruptly. Many of the planned activities of the project had to be terminated abruptly. Many of the planned activities of the project had to be cancelled, even though the project was continued.

These events seem to have damaged the credibility of certain local resource teams, not so much because the project's termination was accelerated, but because changes in policy on the part of the National Science Foundation interrupted many activities in progress and contributed to the impression that the project was terminating in disgrace. This was not the case, but such impressions are more easily created than dissipated.

Higher Level Mandates for Curriculum Emphasis

Another type of change that has been observed results from shifts in emphasis at high levels in the educational hierarchy. These changes may be either positive or negative from the point of view of USMES, and may be rapidly superceded. In the recent past, such developments have usually shifted emphasis to more training in basic skills. On the other hand, a recent change that has had a profound effect on USMES implementation in one state has been the passage of a state law citing problem solving as a major process goal for all schools. This change in emphasis had a strong positive effect on the growth of one resource team in this study (Team 6).

SUMMARY

Of all factors influencing USMES implementation and dissemination that have materially changed in the course of this program, the back-to-basics movement and a diminution of federal, state, and local funds seem to have been the most far-reaching in their effects. A growing disenchantment with inservice training of all kinds was proposed by several teams as a major problem; however, our feeling is that attitudes about inservice training reflect the general growing unpopularity of training in innovative

educational techniques. Abrupt changes in the status of the USMES project as a whole seems to have had a significant negative effect on local teams, since some were embarrassed that USMES appeared to be a discredited program. Changing emphases in education due to mandates at the state level were significant in their effects, both positive and negative, on local resource teams.

USMES IMPLEMENTATION STRATEGIES

The teams in this study have attempted to foster USMES through a wide variety of implementation strategies. The discussion that follows describes some of the major strategies, some of the major factors affecting those strategies, and the properties, advantages, and disadvantages of each strategy.

The Demonstration-School Strategy

The demonstration-school implementation strategy is characterized by the following assumption: Initial efforts in an area should focus on developing a strong, single-school implementation of USMES to demonstrate the viability of the program. This is a plausible assumption, and a number of teams have been inclined to adopt it. Teams 5,10, and 11, and elements of Team 12, are among them.

Team 5 is employing a demonstration-school strategy perforce. After some initial difficulties, all nationally trained members resigned from the team leaving it to be reformed by one member through local training of new personnel. As a result, the team has not recently engaged in any significant attempts to implement USMES outside the school. However, since the local implementation at the host school has been rebuilt, the team is in a relatively strong position to begin implementing USMES through the demonstration-school strategy. Another factor suggesting that the team ought to follow a demonstration school strategy is that the host school of Team 5 is recognized throughout its district as a model school for developing innovative educational programs.

Team 10 is following a demonstration-school strategy voluntarily. The principal is particularly anxious to make "every student and teacher an active, real problem solver" at her school. In pursuit of this goal, little outside implementation activity is being attempted until the host school implementation has become very strong.

Team 11 is also pursuing what might be described as a demonstration-school strategy. It is located at a university lab school, which makes such a strategy particularly appropriate, since it is not only convenient, but mandated, for a lab school to function as a demonstration school.

One segment of Team 12 is developing into a demonstration school because it is guided by a very active building principal who wishes to strengthen USMES at his school for staff development and student-attitude improvement.

Apparently, the chief advantages of the strategy are the following:

- High quality USMES is possible where the entire attention of a resource team is devoted to strengthening the program at a particular site.
- Where district funding for USMES is not available on a broad scale, building an USMES demonstration school may be the only strategy that can be funded.
- Where a building principal is team leader, it is often possible to combine certain practical and professional goals of the principal (such as running the school more effectively, improving student attitude, and developing staff) with pursuing a demonstration-school strategy.
- A demonstration school strategy may work where other strategies have failed. For example, in the case of Team 12, a strategy of relatively wide spread dissemination was attempted and did not succeed; accordingly, at least a portion of the team fell back on a demonstration-school strategy as a "second-line" implementation mechanism.
- A functioning demonstration school is perceived by certain leaders as an effective self-selection device for allowing prospective workshop participants to assess the nature of USMES in the classroom and to determine, in a more informed manner, whether they should participate in an USMES workshop. This is seen by all observers as a desirable effect, since it is futile to give costly training to workshop participants who are not interested, and it is detrimental to the local image of USMES

The chief disadvantage of the strategy is that it is unsuitable for promoting implementation and dissemination of USMES at other sites. Indeed, it has been claimed that the example of a successful demonstration school, while it may make individual teachers wish to adopt USMES, is not an effective mechanism for convincing district-level or even building-level supervisors to adopt USMES. Local principals may be deterred from adopting the program, even if they see it is working well, because it "belongs" to another, perhaps rival, principal in the district. District-level administrators may be deterred from allocating funds to promote widespread USMES implementation, because the demonstration school appears to "prove" it is possible to have a strong USMES program without district funding. (Of course, this is actually possible only with very strong principal support, such as may be secured if the building principal is a resource team leader.)

Creating Sub-teams: Team-wide Dissemination

Another approach to USMES implementation and dissemination is that followed by Team 6. The initial activity of Team 6 was to train members for new local resource teams. This was done immediately after the formation of Team 6, before any demonstration schools or even any implementation of USMES on the part of new team members had been built up.

The chief advantage of this procedure seems to be that a widespread implementation effort, encompassing many local districts, can be instituted from the start, transcending local boundaries and rivalries. Moreover, this is a cost-effective procedure, since it rapidly initiates a process of exponential growth within the area covered.

Potentially, there are at least two serious disadvantages to this procedure.

- If team members on the initial team are not thoroughly familiar with USMES, the training of members in second-level resource teams may not be effective, and original members may not be capable of delivering satisfactory follow-up support.

- When this method is used, it puts a great deal of responsibility on the newly created local teams to pursue dissemination and implementation of the program. Thus, it is not surprising that, in the case of Team 6, not all of the newly instituted teams actually survived.

Selecting Workshop Participants

One of the most essential components in any implementation strategy, according to virtually every team in the study, is that prospective workshop participants be carefully selected and, if possible, self-selected. Most of the teams that instituted widespread implementation and dissemination programs immediately following national workshop training warn against allowing administrators to choose participants for workshops, or setting up large workshops for participants who have not expressed interest in the program. In the case of Team 9, the problem of effective implementation was augmented for new leaders after the reorganization of the team, because of a history of superficial and indiscriminate USMES dissemination and implementation activities in the target districts. Thus, it appears that one of the most effective applications of resource team time and effort is selecting workshop participants carefully.

Transcending Local Administrative and Building Boundaries

One strong potential advantage of implementing USMES initially "above the building level" is that it is possible to work across local administrative and operational boundaries. Some of the most successful resource teams began with an implementation at the level of curriculum specialist or curriculum coordinator.

This principle may in some cases be generalized to a much higher administrative level. Team 8, for example, has encountered serious and persistent problems as a result of the complex area divisions of the large metropolitan district in which it is located. Substantial expenditures of funds and resources, both for training and follow-up support, have yielded disappointingly weak results in the case of Team 8. It is the view of central office personnel that, due to the special administrative conditions pertaining to Team 8, an initial thrust at the level of the metropolitan school board, or at the level of the state legislature, would have been required to permit efficient implementation of the program.

University Involvement in Resource Teams

Although, as we have indicated, the use of university personnel as team leaders has serious disadvantages, the involvement of university personnel in local resource teams has proved extremely helpful in a number of ways.

Some of the most important of these are as follows:

- The continuing involvement of university personnel in Team 3 has facilitated evaluation of the program by university personnel.

- The use of a college or university as a "base" for workshop and other training activity has the effect of transcending administrative boundaries in the areas affected. Thus, local jealousies and rivalries do not hinder implementation and dissemination activities as they would if training efforts were mounted by teachers, principals, or local officials.

- The involvement of university personnel in a lab-school setting, such as that of Team 11, permits the combination of some of the best features of the demonstration-school strategies and a number of other strategies that actively facilitate widespread dissemination and implementation of the program. This is possible because the lab school functions as an interface between university personnel, perceived as "authoritative" and tending not to excite local jealousies and rivalries, and school district personnel on many levels.

- Another important role of university personnel in resource teams that has yielded strong results in some areas is giving USMES courses. This method has been successful for preservice and inservice training; presentation of USMES material has ranged anywhere from simple dissemination (for example, providing initial familiarization in survey courses) to full-scale implementation training (giving inservice or preservice courses specifically in USMES techniques).

Solicitation of State Mandates for USMES

Another implementation technique suggested by this study is soliciting state mandates to encourage USMES dissemination.

Team 6 has benefited greatly from a state mandate proposing problem solving as a major process goal for all students in the state.

In another state (the state of California) all have noted noted the extreme difficulty, for USMES, of competing against other curriculum programs mandated by the state legislature. From this, it would appear that, in certain locations at least, soliciting state legislature support, not simply for problem solving but specifically for the USMES program, may be desirable.

Correlation with Other Curriculum Areas

One technique that has proved particularly effective for some teams (Team 2, for example) is to prepare careful correlation studies relating USMES with other recognized curriculum areas. This has the effect of legitimizing USMES by merging it with recognized curriculum areas. We believe that many teams could have profited from using this technique.

Symbiotic Implementation

Particularly in two cases in this study (Teams 1 and 6), teams were formed by establishing symbiotic relationships between USMES and programs that were already operating. The details of these symbiotic relationships are discussed more fully in the individual narratives pertaining to the teams. Generally, however, it can be stated that these relationships have been among the most widely effective, and highly cost-effective, of the methods attempted by teams in this study.

On a smaller scale, two teams, (Teams 10 and 5), have attempted to develop symbiotic relationships between USMES and certain aspects of the host schools at which USMES programs are implemented. In the case of Team 10, a great deal of the routine administrative and housekeeping activity of the school is performed by students. The methods devised for employing students in this way were developed in the course of special USMES challenges. Team 5 is employing a two-tiered USMES program: Individual teachers carry out the regular USMES challenges in their classes. At the same time, general problems, such as safety, noise, and discipline in common areas, are the subject of school-wide USMES challenges. In both cases, it appears that USMES is strengthening itself locally by involving itself in these tasks. Presumably, the overall effect of this kind of symbiotic relationship is positive, although there is a least the possibility that USMES may have changed into something other than a real problem-solving curriculum to meet local practical needs, and hence, have become less effective as an instructional tool.

PART 4 Team-Trained Teachers

TEAM-TRAINED USMES TEACHERS

FOCUS OF THE STUDY

One of the most critical questions that must be addressed in any assessment of the USMES resource team training program is: How effectively are local workshop participants trained? What is necessary is to assess how fully and accurately the product--USMES--is delivered to workshop participants through the resource team program. We will attempt such an assessment by addressing four issues.

1. *How Frequently and How Extensively Do Resource Team Trainees Use USMES?* In our discussions to this point, we have focused on the resource team itself. We have, no doubt unavoidably proceeded no further than the question of *how many* workshop/informational participants each team has reached. To focus one's attention on this issue, however important it may be, is to ignore half of the process of propagating USMES: Inducing workshop participants to adopt the program.

   It is possible to imagine that some teams, although they reach many workshop participants, persuade relatively few to adopt USMES; others, by giving better workshops, by offering more extensive followup activities, or by some other means, may persuade almost all participants to use USMES, and may make it easy for them to continue doing so. Both situations are possible. It is necessary, therefore, in assessing the success of a resource team (or a resource team program), to estimate how many trainees finally use USMES in their classes, and how frequently they do so.

2. *How Much of the USMES Curriculum is Typically Used by Resource Team Trainees?* It is desirable, not only that as many local workshop participants as possible use *some* of the USMES curriculum, but also that workshop participants be made comfortable with *as much as possible* of the curriculum.

A given team might achieve very effective results by focussing all its training efforts on a small portion of the USMES curriculum; but the variety of USMES transmitted might in fact be only a small "sub set" of the full USMES curriculum.

In point of fact, investigators in the field have encountered, with disturbing frequency, team-trained teachers who are familiar with only two or three of the 24 USMES units, and largely unfamiliar with other materials.

3. *How Closely Do Team-Trained Teachers Follow Recommended Procedures for USMES Use?* In the view of the USMES central staff,for USMES to be successful, certain recommendations concerning the scope and conduct of USMES challenges (length of session, frequency and type of group discussion, minimum number of weeks spent per challenge, minimum number of sessions per week, etc.) must be followed quite closely. Therefore, it is important to ascertain how fully these recommendations are communicated to team-trained USMES teachers, and how frequently they are observed in practice.

4. *How Well Are the Philosophical Values of USMES Transmitted to Resource Team Trainees?* One frequent complaint made by teachers in the early stages of their USMES training is that they were not being told "what to do." This comment points to one of the most characteristic traits of the USMES program: It is not a concrete method, capable of being captured in a sequence of well-defined teaching steps or a self-contained body of text materials. Rather, it is a style of teaching, an interconnected set of values, goals, and strategies, that must in actual use, be coordinated by the individual teacher.

   Hence, USMES curriculum materials, USMES units, and general recommendations as to how they should be employed, merely facilitate good USMES. The essence of the program is its values, goals, and priorities. Therefore, it is of particular interest to determine how accurately these values have been transmitted to second-generation, team-trained USMES techers.

METHODOLOGY

The questionnaire for team-trained teachers ("QT3") was the chief instrument used in this study to address the four issues cited above. This questionnaire was used in two forms: A full three-page form and abbreviated one-page form, both of which are reproduced in the Appendix.

All individuals trained by the 15 teams in this study for whom addresses could be ascertained (they numbered 1147) were initially sent the three-page questionnaire. Of those queried, 196 responded. Another 81 questionnaires were returned to us, because the addresses were not valid. Thus, out of 1,066 teachers who presumably received the questionnaire, 196 (about 18.4%) responded.

Unfortunately, with so low a return rate, it was feared that only the most positive and favorably inclined among the population had taken the trouble to respond. To ascertain the degree to which this 18.4 percent were representative of the population to which they belonged, a group of 330 individuals was selected at random from the 868 teachers who had, presumably, received but not responded to the questionnaire. Individuals in this group were then pursued actively, through repeated mailings of the one-page form of the questionnaire.

Ultimately, about two-thirds of these individuals responded. Since all questions in the short form of the questionnaire were also asked in the long form, it was then possible to test, by statistical means, the degree to which our fears of falsely positive results were well-founded. (The details of all computations and tests pertaining to this problem are given in the Appendix.) In general, it was discovered that the original 196 respondants were representative of the large group of 1147 in all issues covered by both questionnaires, with one exception: Individuals who claimed they had not actually attended a training workshop or course tended to leave the initial mailing unanswered, and answered the subsequent, shorter, repetitive requests in relatively greater numbers. Other critical issues

which, as indices of respondent satisfaction, might be expected to affect return rates (did the workshop provide enough training? enough information? have you used USMES with your students? etc.) did not differ significantly between the two groups, once those individuals who claimed they had *not* received training were excluded from both groups. (The Appendix gives details).

When the individuals who claimed not to have received training were excluded, our total sample amounted to 339 individuals. Of these 339 individuals. information concerning some was more complete than that concerning others. This was especially true because many of the items on the questionnaire were couched in "open-ended" form, and many participants either failed to answer or answered equivocally.

An attempt was made throughout to avoid over-estimating the degree to which respondents were positive in their reactions to USMES and the degree to which they used USMES in their classes. For example, the tabulations of how many units respondents had carried out in their classrooms were made, not by asking respondents how many units they had done, but which units they had done. Tabulations of how many trainees had used USMES were made, not on the basis of a direct question such as, "have you used USMES with your students?" But rather according to whether respondents listed any units in reporting which challenges they had used.

USE OF USMES BY TEAM-TRAINED TEACHERS

Some information is available on whether workshop participants, prior to attending USMES teacher-training workshops, had already decided to use USMES in their classes. The QT3 (long form) asked: "When you attended a workshop or a course, ... had you already decided to use USMES?" and "When you attended the workshop or course, ... were you just looking for information about USMES?" Perhaps because questions were open-ended in format, or perhaps because participants were not clear about their intentions, a relatively small number of individuals responded. However, as the following table shows, approximately 5 percent of those responding had already decided to use USMES, and approximately 75 percent were "just looking for information".

Prior Intentions of Workshop Participants, All Teams

Intention	*No. of Participants Responding*	*Percent Responding "Yes"*
Had decided to use USMES already	68	5.2 %
Just looking for information about USMES	123	74.8

At the workshop itself, most participants, by their own evaluation, received "enough training"; almost all, by their own evaluation, received "enough information." This can be seen by the following table.

General Assessment of Workshops, All Teams

Item	*No. of Participants Responding*	*Percent Responding "Yes"*
Did workshop provide enough training?	243	62.2%
Did workshop provide enough information	211	91.9

However, the most important single piece of information on the use of USMES by team-trained teachers is how many of those trained actually tried USMES. The following table gives numbers of team-trained teachers who tried USMES, broken down according to the teams by which the teachers were trained. The numbers presented in this table are derived from responses to the question, "Please indicate which USMES units you have used this year, last year, and before last year." (This is Question 5 in the short form of the QT3, Question B2 in the long form.) All 339 respondents who did not deny having received USMES training were included in the tabulation; thus the figure used is the most conservative one possible, since a failure to respond is automatically treated as a negative response.

Percent of Team-Trained Teachers Who Tried USMES

Team	*Number of Teachers*	*Number Who Tried USMES*	*Percent Who Tried USMES*
Team 1	47	19	40.4%
Team 2	29	12	41.4
Team 3	42	33	78.6
Team 4	25	19	76.0
Team 5	4	3	75.0
Team 6	29	21	72.4
Team 7	33	29	87.9
Team 8	41	34	82.9
Team 9	6	2	33.3
Team 10	4	3	75.0
Team 11	7	1	14.3
Team 12	13	10	76.9
Team 13	29	15	51.7
Team 14	18	11	61.1
Team 15	12	0	0.0
Total	339	212	65.2%

One-way analysis of variance with percentage of teachers who tried USMES as dependent variable, team as independent variable: $F(14,324)=6.2117$, $p < .001$.

The reader will note that the percentage of teachers who tried USMES, out of all workshop participants, differs substantially from team to team, and that an analysis of variance shows significance with $< .001$. It is clear, therefore, that individual teams differ significantly in the percentage of their workshop participants who actually use USMES. Especially considering the small value of N for many teams, however, it is unlikely that the tabulation given above contains enough information to explain this significant variation in any more systematic way, as, for example, by proposing causal factors in team-training methods or local political environment.

From the reader's point of view, it is probably most important to note that the percentage of team-trained teachers who actually tried USMES overall is 62.5 percent; and that the differences in percentages from team to team in the preceding table do show significant differences among the teams.

The preceding table showing the percentages of participants trained by each team who actually tried USMES can be regarded as an index of team effectiveness in motivating and persuading workshop participants. The following tabulation, giving the average number of challenges done by team-trained teachers who *tried USMES*, provides a separate index of the degree to which the training teams give yields, a capability for USMES teaching that is sufficiently satisfying to invite repetition. The following table shows the mean number of challenges conducted by team-trained teachers who used USMES.

USMES Challenges Conducted by Teachers Who Tried USMES

Team	*Number of Team-Trained Teachers Who Tried USMES*	*Mean Number of Challenges Done*
Team 1	18	3.4
Team 2	12	3.9
Team 3	33	3.3
Team 4	19	5.6
Team 5	3	2.0
Team 6	21	3.3
Team 7	29	4.4
Team 8	34	4.0
Team 9	2	2.5
Team 10	3	1.3
Team 11	1	1.0
Team 12	10	2.7
Team 13	15	2.7
Team 14	11	1.9
Total	211	3.6

One-way analysis of variance with mean number of challenges done as dependent variable, team as independent variable: $F(13,197)= 1.3616$, $p=.181$.

As in the previous table, values vary noticably among the teams. However, in this case, an analysis of variance with mean number of challenges conducted as dependent variable and team as independent variable is significant only at p=.181. Further reasons for discounting the team-wide differences shown in this table will occur to the reader (for example, the number of challenges conducted by any teacher will depend to some extent on the date of the workshop attended, an item that in turn depends on the age of the resource team conducting it). However, the relatively high overall figure (3.6 challenges) is a good general indication of the strength of the resource team program.

A tabulation that follows logically from the two preceding ones, and indicates the overall effectiveness of each team in promoting USMES use by the "average" workshop participant, gives the mean number of challenges conducted by all workshop participants.

Challenges Conducted by All Workshop Participants

Team	*Number of Workshop Participants Responding*	*Mean Number of Challenges Done*
Team 1	46*	1.3
Team 2	29	1.6
Team 3	42	2.6
Team 4	25	4.2
Team 5	4	1.5
Team 6	29	2.4
Team 7	33	3.9
Team 8	42	2.6
Team 9	6	0.8
Team 10	4	1.0
Team 11	7	0.1
Team 12	13	2.1
Team 13	29	1.4
Team 14	18	1.2
Team 15	12	0.0
Total	338*	2.3

One-way analysis of variance with mean number of challenges done as dependent variable, team as independent variable: $F(14,323)= 3.5412$, $p < .001$.

**Less one value, illegible.*

As before, there are noticable differences among the teams. In this case, too, the differences are significant to $p < .001$. However, due to the same factors that apply to previous tabulations, little can be made of these differences; one merely notes that they exist.

Perhaps the most important figure in the tabulation above is the overall figure--2.3-- the mean number of challenges conducted by team-trained teachers, study-wide. This figure affords, at least potentially, an excellent indication of the overall "return-on-effort" per individual resource team workshop participant.

Another sort of question that may be asked is: What percentage of USMES users teach *n* or more USMES challenges? The following table gives a listing study-wide, of how many teachers conducted various numbers of challenges.

Total Challenges Taught, Among Teachers Who Tried USMES

Number of Challenges	*Number of Teachers*	*Percent of Teachers*	*Cumulative Percent*
1	61	18.0%	28.9%
2	44	20.9	49.8
3	32	15.2	64.9
4	23	10.9	75.8
5	16	7.6	83.4
6	6	2.8	86.3
7	5	2.4	88.6
8	4	1.9	90.5
9	4	1.9	92.4
10	3	1.4	93.8
11	2	0.9	94.8
12	4	1.9	96.7
13	1	0.5	97.2
14	1	0.5	97.6
15	2	0.9	98.6
16	1	0.5	99.1
17	1	0.5	99.5
18	1	0.5	100.0
Total	211	100.0%	100.0%

Median = 2.5 Challenges

This table provides some information that is intuitively easy to grasp. For example:

- Only 28.9 percent of all team-trained USMES teachers stopped after one challenge.
- Half of the team-trained teachers who tried USMES have now conducted three or more USMES challenges.
- About 10 percent of those who tried USMES have conducted nine or more challenges to date.

SUMMARY

According to the QT3, about 5 percent of those individuals attending team-run workshops had already decided to use USMES. Following the workshop experience, 62.5 percent of all participants actually tried USMES in their classrooms. Of those who tried USMES, the mean number of challenges conducted to date is 3.6. Also, of that group, only 28.9 percent stopped doing USMES after one challenge.

Team-by-team variation in percentage of participants who tried USMES is significant to $p < .001$. However, no simple causal factors distinguishing between relatively successful and relatively unsuccessful teams have been suggested.

HOW MUCH OF THE USMES CURRICULUM IS TYPICALLY USED BY RESOURCE TEAM TRAINEES

USMES as a curriculum includes such items as Design Lab tools and materials, teacher Resource Books, How-To Cards, and Background Papers. An inquiry was made in the long form of the QT3 to ascertain what percentage of workshop trainees made use of these items, provided they had access to them. The respondents' reports are summarized in the table below.

Use of USMES Materials, All Trainees (n = 185)

Item	*Number of Respondents Reporting*	*Percent of Respondents Reporting Use Where Access Exists*
Design Lab	62	71.9%
Resource Books	83	84.3
"How To" Cards	62	58.1

The reader should be cautioned that the table above indicates the percent of respondents reporting use if *access exists*. This limitation may introduce a certain distortion, and it certainly reduces the number of respondents reporting in each category. However, since in our view access to USMES resource materials is logically independent of individual attitude toward these resources, and the latter is more relevant where the effectiveness of the resource team program is being considered, this limitation is probably for the best. Availability of district funding has a large effect on access to resource materials, particularly Design Lab materials; but it is chiefly workshop training that affects participants' attitudes toward the use of these items and participants' skill in using them.

"How-to" cards are the least popular resource. It is difficult to know whether their relatively low rate of use reflects relatively incomplete training in their use at team-run workshops, or some property of the cards themselves. (The final revised, illustrated versions were not available to these teachers.) The other materials--Design Lab materials and resource books--are quite widely used and accepted. Frequency of access, reported through a separate question on the QT3, is as follows.

Access to USMES Materials, All Trainees (n = 185)

Item	*Number of Respondents Reporting*	*Percent of Respondents Having Access*
Design Lab Tools and Materials	98	50%
Resource Books	102	76.5
"How To" cards	110	61.8

These figures are not surprising: Resource books are most widely available, and the relatively expensive Design Lab materials are least widely available.

Since team-run workshops typically instruct participants in the use of USMES through trail challenges and since, of necessity, only a few challenges can be covered in the course of a workshop, there is reason for some anxiety that participants, so trained, will conceive their training as limited to just those units covered at the workshop they attended. Of course, this will ultimately have harmful effects, since continuing use of USMES must inevitably become boring to teachers, even if they change classes frequently.

Accordingly, the QT3 inquired not only how many units, but which units were used by each respondent. The following table collects the information elicited.

Use of USMES Units

Unit	*Number of Respondents Reporting Use*	*Percent of Total*
Advertising	34	10.0%
Bicycle Transporation	10	2.9
Classroom Design	48	14.2
Classroom Management	25	7.4
Consumer Research	82	24.2
Describing People	60	17.7
Designing for Human Proportions	21	6.2
Dice Design	12	3.5
Getting There	9	2.7
Growing Plants	65	19.2
Lunch Lines	12	3.5
Manufacturing	36	10.6
Mass Communications	5	1.5
Nature Trails	9	2.7
Orientation	7	2.1
Pedestrian Crossings	15	4.4
Play Area Design & Use	17	5.0
Protecting Property	6	1.8
School Supplies	12	3.5
School Zoo	23	6.8
Soft Drink Design	32	9.4
Traffic Flow	8	2.4
Ways to Learn/Teach	11	3.2
Weather Predictions	23	6.8
LOCALLY DEVELOPED UNITS	41	12.1

The tabulation speaks for itself--it is clear that some units are used a great deal more than others, yet all units are used, and use frequencies do not differ wildly.

SUMMARY

Use of Design Lab materials and resource books by respondents who have access to these items is frequent: 71.9 percent and 84.3 percent respectively. Use of "How-To" Cards (at 58.1 percent) is, perhaps, somewhat disappointing in frequency.

Some USMES units are used far more often than others; however, all 24 units available to the respondents are used, and the frequency of use does not vary more than about an order of magnitude, among all units.

HOW CLOSELY DO TEAM-TRAINED TEACHERS FOLLOW RECOMMENDED PROCEDURES FOR USMES USE

It is important to ascertain not only how effectively knowledge of curriculum materials is transmitted to workshop participants under the resource team program, but also how effectively the informal recommendations for their use are transmitted, and how seriously they are taken. The discussions that follow deal with a number of cases in which specific recommendations can be compared with tabulations of practice in the field.

Number of Students Working on a Challenge

The USMES central staff recommends that "at least 10 to 12 students, or one-third to one-half of the class" be working on a challenge at any given time. The following table gives an indication of how closely this recommendation is followed among team-trained teachers in the field.

Students Involved in USMES Classes (n = 112)

Item	*Mean Number Per Class*	*Median Number*
Students actively involved in USMES	23.8	25.0
Students in USMES class (total)	27.6	28.1
Ratio of students actively involved in USMES to total of students in USMES class	.884*	

**This is not equal to the ratio of mean values for A and B, since classes of different size have a different "weight" in the computation of those values.*

In this instance, it is clear that central staff recommendations are broadly followed by team-trained teachers. Fully 88 percent (much more than the minimum "one-third to one-half" recommended by USMES central staff) of USMES teachers' classes are, on the average, included in work on USMES challenges. Likewise, teachers are doing challenges with groups of 20-25 students, on the whole, rather than with the minimum of 10-12 students recommended by central staff. Only seven respondents (6.3 percent of the total responding) reported conducting USMES with fewer than ten students.

Discussions

USMES central staff and other experienced personnel lay great stress on the importance of discussions in the course of USMES challenges, both whole-class discussions and small-group discussions. It is further advised that "regular exchange of ideas [be] allowed for" and that discussion be held "at least once per week; sometimes as often as at the beginning and end of each session." The table below gives some indication of how these suggestions are followed by team-trained teachers in the field.

Use of Discussion in USMES Challenges (n = 185)

Type of Discussion	*Number of Teachers Reporting Use*	*Percent of All Respondents Reporting Use*
Whole-class Discussion	82	44.3%
Small-group Discussion	82	44.3
Discussion at Beginning of Session	60	32.4
Discussion at Middle of Session	22	11.9
Discussion at End of Session	52	28.1
Student-run Discussion	64	34.6
Teacher-run Discussion	84	45.4

The numbers given above afford only a superficial indication of practice in the field; however, they do indicate that discussions are taken seriously, that they are used to begin or end sessions (rather than to break sessions in the middle), and that student-run discussions are relatively common. In general, based on the results of the QT3, use of class discussion among team-trained USMES teachers is moderately in accord with central staff recommendations.

Length of USMES Sessions

USMES central staff recommendations concerning length of USMES sessions is as follows: " [Length of session] varies depending on age of students and work to be done, probably anywhere between 15-20 minutes and 2-3 hours." The following table gives an indication of the practice of team-trained teachers.

Length of USMES Session, All Respondents (n = 184)

Average Length of Session (minutes)	*Number of Respondents*	*Percent of Respondents*	*Cumulative Percent*
10-19	10	5.4%	5.4%
20-29	17	9.2	14.7
30-39	30	16.3	31.0
40-49	75	40.8	71.7
50-59	20	10.9	82.6
60-69	19	10.3	92.9
70-79	8	4.3	97.3
80+	5	2.7	100.0

Mean: 32.5 minutes

As this table indicates, practice among team-trained teachers is fairly well in accord with central staff recommendations. If any difference is to be found, it is that USMES sessions in the field are somewhat briefer than those contemplated by the program's developers. Central staff envisions "15-20 minutes" as a low bound, whereas teachers in the field have conducted sessions whose *mean* length is 32 minutes. Likewise, it seems clear that very few sessions ever reach the uppermost limit envisioned by central staff recommendations.

It is beyond the scope of this study to ascertain whether pragmatic problems (and, perhaps, practical enlightenment of theoretical norms by experience in the field) or workshop training account for the difference between central staff recommendations and teacher practice. However, one plausible explanation is that scheduling factors have truncated sessions in the field, by making long sessions impossible in many cases

Sessions per Week

Central staff recommends that USMES sessions be held a minimum of two-to-three times per week. The following table shows practice among team-trained teachers.

USMES Sessions per Week

USMES Sessions per Week	*Number of Respondents Reporting*	*Percent*	*Cumulative Percent*
1	7	6.9%	6.9%
2	41	40.6	47.5
3	35	34.7	82.2
4	6	5.9	88.1
5	12	11.9	100.0
Total	101	100.0%	

Mean: 2.752 Sessions per Week

As this table shows, team-trained teachers operate close to the norm recommended by central staff.

Number of Weeks per Challenge

It is generally recommended by the USMES central staff that challenges last from a minimum of "six to eight weeks." The table below shows the practice of team-trained teachers in the field.

Typical Number of Weeks per Challenge

Typical Length of Challenge in Weeks	*Number of Respondents Reporting*	*Percent of Total*	*Cumulative Percent*
1	4	4.3%	4.3%
2	14	14.9	19.1
3	18	19.1	38.3
4	20	21.3	59.6
5	7	7.4	67.0
6	10	10.6	77.7
7	5	5.3	83.0
8	6	6.4	89.4
9	3	3.2	92.6
10	2	2.1	94.7
12	3	3.2	97.9
14	1	1.1	98.9
16	1	1.1	100.0
Total	94	100.0%	

Mean: 4.862 Weeks per Challenge

At this table shows, practice in the field conforms fairly well to central staff guidelines. However, challenges in the field are "on the short side."

SUMMARY

In general, the USMES central staff recommendations pertaining to length of USMES challenges (both in weeks overall and minutes per session), to number of sessions per week, to use of discussion during USMES challenges, and to number of students involved are followed quite closely in the field.

HOW WELL ARE THE PHILOSOPHICAL VALUES OF USMES TRANSMITTED TO RESOURCE TEAM TRAINEES

It is clear that a great deal of the identity of USMES resides in its philosophical values--a network of values, goals, and priorities that are subtly interconnected and ordered. One of the most delicate problems in analysis is to ascertain the degree to which this network of values is delivered intact to team-trained teachers.

The approach taken with the QT3 questionnaire was to generate a set of 18 values in USMES teaching. (These are, in fact, all genuine values: none are "red herrings.") Respondents to the questionnaire were asked to select the five "most important" factors from this list. Members of the USMES central staff were asked to do the same. The relationship between the central staff ranking and the team-trained teachers' ranking of these items indicates an overall "drift" of philosophical values. The interrelationships among rankings delivered by the 15 separate teams provide an index of the "uniformity of treatment" afforded by the resource team program.

The following table compares the responses of team-trained teachers with those of central staff member for the 18 philosophical values. The order in which items appear is not that used in the questionnaire, but is in order of descending popularity of factors among team-trained teachers.

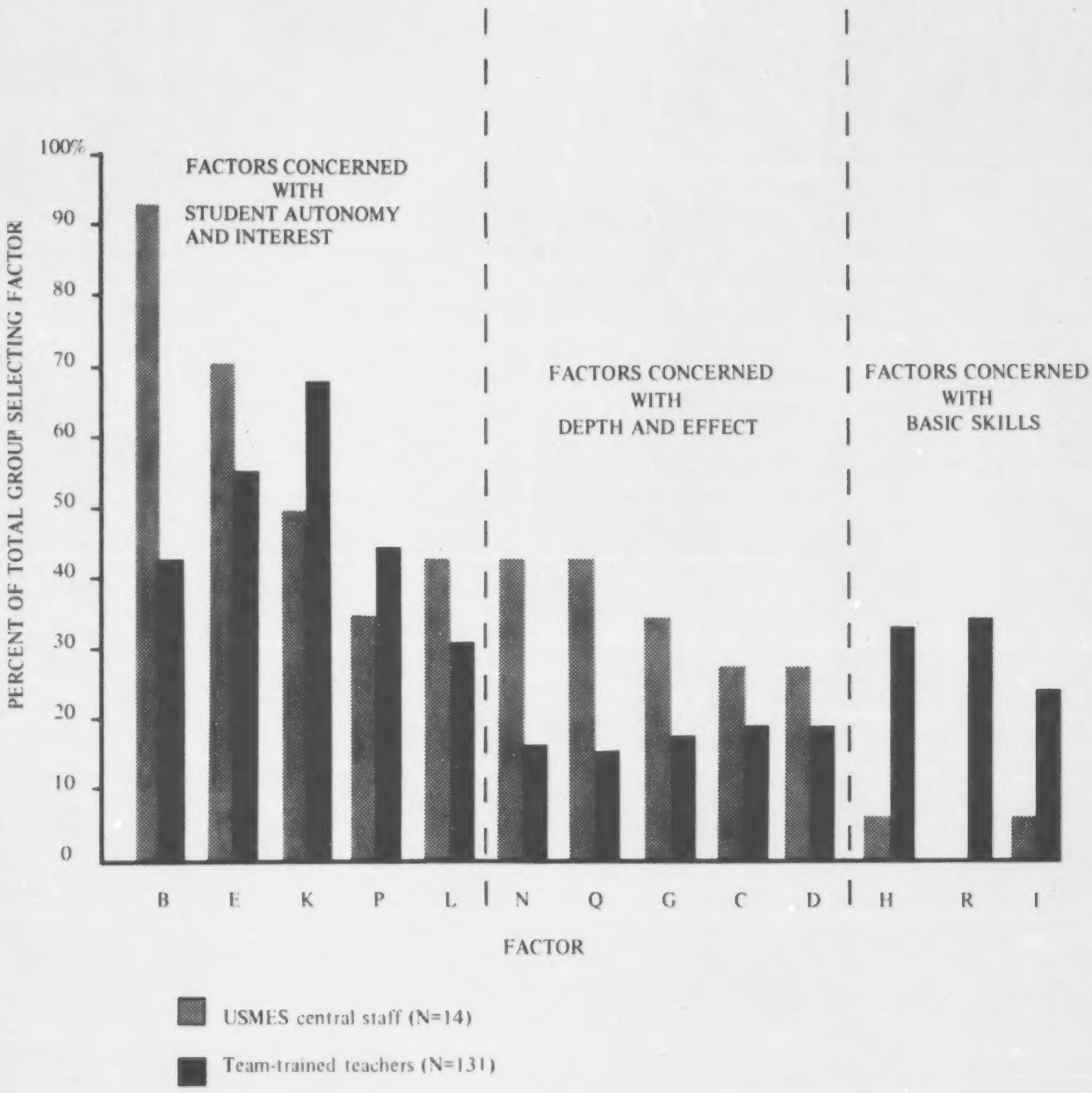
	Factor	Team-Trained Teachers: Number of Respondents Who Selected Factor (n = 131)	Percent	Rank	USMES Central Staff: Number of Respondents Who Selected Factor (n = 14)	Percent	Rank
K.	Students interact with one another in productive, cooperative ways.	90	68.7%	1	7	50.0%	3
E.	Students make plans and decisions about how to proceed--what to do, who will do it, how it will be done.	73	55.7	2	10	71.4	2
P.	Teacher allows students to make mistakes and helps them learn from their errors.	58	44.3	3	5	35.7	7.5*
B.	Problem is a real concern to the students.	55	42.0	4	13	92.9	1
R.	Teacher teaches skills in a meaningful context.	47	35.9	5	0	0.0	17*
H.	Students apply math and science skills and concepts.	45	34.4	6	1	7.1	13*
L.	Students take responsibility for improving the problem situation.	41	31.3	7	6	42.9	5*
A.	Problem arises naturally from an event or discussion.	33	25.2	8	0	0.0	17*
I.	Students apply language arts and social science skills and concepts.	31	23.7	9	1	7.1	13*
C.	Problem is complex enough to have no "right" solutions and to require in-depth investigations.	26	19.9	11*	4	28.6	9.5*
O.	Student work relates to solving the problem.	26	19.9%	11*	1	7.1%	13*
D.	Problem stiuation really can be improved as a result of the students' work.	26	19.9	11*	4	28.6	9.5*
G.	Students regularly discuss progress--that they have accomplished and what remains to be done.	24	18.3	13	5	35.7	7.5*
N.	Student work is careful and thorough, not superficial or haphazard.	23	17.6	14.5*	6	42.9	5*
F.	Students work in small groups on different tasks.	23	17.6	14.5*	0	0.0	17*
J.	Students use tools and building materials.	13	9.9	16	1	7.1	13*
Q.	Teacher provides redirection when necessary, steps in to get students refocused on the problem and the investigation.	20	3.0	17	6	42.9	5*
M.	Students arrive at a solution to the problem and the unit comes to a natural conclusion.	9	1.4	18	1	7.1	13*

** In cases where values are equal, mean rank numbers are listed.*

From the table above, it is clear that strong similarities relate the rankings given to these values by the two groups. For example, factors conducive to student autonomy and interest (B,F,K,P,L) are ranked high by both groups; factors conducive to thorough, practically applicable work are given intermediate values, though they receive systematically higher ranking from central staff members (N,Q,G,C,D); items specifically mentioning training in basic skills (H,R,I) are given higher ratings by team-trained teachers than by central staff members.

Graphic representation of the relative weights given the 13 factors chosen as most popular overall follows.

POPULARITY OF FACTORS
AMONG TEAM TRAINED TEACHERS AND USMES CENTRAL STAFF



The histogram not only displays the previously mentioned groupings (factors pertaing to student autonomy and interest, leading to thorough and practically applicable work, and pertaining to basic skills), but also shows a fairly strong positive correlation (at least among these 13 relatively popular items) between the rankings of central staff and the rankings of team-trained teachers. By and large, it appears that the philosophical outlook that results in a ranking of these 18 values is transmitted more or less intact from central staff to team-trained teachers, except for differences in viewpoint reflecting the natural concerns of both groups. Thus, it seems to us that the transmission of philosophical values is effected with considerable success by the resource team program overall.

A different question, related to the question of "drift" but not identical to it, is the question of "uniformity of treatment." This is reflected in how much trainees differ systematically from team to team, in selecting values as important. The following table summarizes the results of 18 one-way analysis-of-variance tests, with frequency of selection as dependent variable and team as independent variable.

Variation Among Trainees of the Fifteen Teams in the Importance Attached to the 18 Factors

Factor	*F (12,118)*	*p*
A	1.0483	.410
B	1.1588	.321
C	0.9738	.478
D	0.9979	.455
E	1.3432	.204
F	0.9288	.521
G	1.5342	.125
H	1.4072	.172
I	1.3751	.187
J	1.1800	.305
K	0.6797	.768
L	1.2291	.271
M	1.1094	.359
N	1.2080	.286
O	0.5135	.903
P	1.7581	.063
Q	0.4756	.926
R	0.9245	.525

(Results of eighteen separate one-way analyses of variance with frequency of selection as dependent variable, team as independent varable.)

As the reader can see, variation among teams is not significant at the .05 level in any of the 18 instances. Even the lowest value encountered, p = .063 for Item P, is probably not worthy of attention, since such a low value is likely to occur once in 18 trials by chance alone.

Thus, it would appear that the hierarchy of philosophical values is transmitted more or less intact from central staff to second-generation teachers and that it is transmitted to trainees quite uniformly among the various teams. (The reader is cautioned that the table above *fails* to confirm, at the level of p = .05, the assumption that each of these items shows significant differences in popularity among trainees of the 15 teams. What makes this relatively impressive, of course, is merely that this "failure to confirm" happens 18 times in 18 tries.

SUMMARY

The ranking of philosophical values among team-trained teachers is both fairly uniform from team-to-team, and reasonably similar to that given by USMES central staff personnel. Thus it would appear that there is little "drift" in philosophical values between central staff and second-generation teachers, and that the treatment given by the 15 resource teams is quite uniform.

S U M M A R Y

The Resource Team Program

USMES, a real-problem-solving interdisciplinary curriculum for elementary school students, employs as its chief delivery and training system a method referred to as the Resource Team Program. The idea of this program is that project-funded training can be employed to produce teachers who are capable both of using the USMES curriculum and of training other teachers as users and/or trainers.

Ideally, it is possible by this means to train a large number of teachers through a relatively small project-level expenditure. However, since the relationships among central staff, resource teams, and USMES users in the field are very complex, a failure at any point in the network can destroy its effectiveness. Therefore, it is important to know under what conditions resource teams survive and under what conditions they disband; under what conditions they reach a large number of local teachers through traing activities and under what conditions they do not; under what conditions they produce trainees who use USMES frequently and with satisfaction, and under what conditions they do not.

This Study

This study focusses on 15 of the more than 50 USMES resource teams. In selecting these 15 teams, an effort was made to seek teams whose activities were already well documented, and which represented a diversity of types in terms of team model, geographic location, and population served. Information upon which the study is based has been gathered chiefly from the following sources:

- Information already on file.
- Information gathered through on-site visits with teams and team leaders.
- Information gathered by questionnaire from team-trained teachers.

All 15 teams received site visits. Questionnaires were mailed to all trainees for whom addresses were available; 397 teachers responded.

The findings of this study may be divided into three basic categories: findings on the growth and survival of research teams; findings on the success of resource teams in training large numbers of teachers; and findings on the effectiveness of team-conducted training activities, reflected in the subsequent use of USMES by trainees.

Findings: Growth and Survival of Resource Teams

One of the most important influences on team survival and growth was found to be the career role of the team leader. Teams led by classroom teachers and principals generally had a good chance for survival and growth, though they often found it difficult to spread USMES in the surrounding area. School district specialists and administrative officials were generally even more successful leaders, though the departure of such leaders often created problems for their teams. By and large, university professors made the poorest leaders; this was not because they lacked ability or initiative, but because their natural career interests did not coincide with the day-to-day activities of team leadership, and they were obliged to "find time" for USMES.

Overall, the teams in the study showed net growth rather than attrition. However, a common cause of attrition, where it occurred, was that individuals who had planned to attend national resource team workshops were unable to do so and were replaced by individuals whose educational philosophies were incompatible with USMES. These individuals created serious problems for the teams, and eventually dropped out.

Another important factor in team survival and growth was what motive led local personnel to accept training and form a resource team. A common motive was staff development--a local principal or school district official wished to use USMES and resource team membership as a device to develop the professional strengths of local personnel. Another common motive among school district officials was finding the philosophy of USMES consistent with their own, and seeing USMES as a vehicle to implement that philosophy. In most cases, both motivations led to strong teams.

Among the motives that led to poor results in terms of team growth and survival were a desire to promote *some* interdisciplinary real-problem-solving curriculum, but not necessarily USMES; and action in response to USMES central staff solicitations.

A very successful arrangement, utilized by two teams in the study, involved incorporating USMES into an existing program to complement that program. This arrangement, for Teams 1 and 6, led to rapid growth. Of course a "team" so constituted is not expected to survive the cooperating project.

Some teams in the study strengthened themselves politically by evolving extensions to "classical" USMES that serve practical needs (policing and housekeeping activities in schools, etc.) or conform to recognized curriculum guidelines (USMES and consumer education, etc.).

Among the most serious hindrances to resource team survival and growth have been the nationwide "back to basics" movement when rigidly applied, and a general lessening in the availability of funding and release time; both have had serious negative effects on all teams, even those that have been most successful overall.

Findings: Success of Resource Teams in Training Large Numbers of Teachers

A major finding is that the career role of the team leader also greatly influenced the success of the team in training large numbers of teachers. Team leaders who were specialists or administrators in local school districts generally were most successful: They influenced the allocation of district funds, held positions from which follow-up training activities could be conducted, and generally were able to transcend territorial boundaries within the district. Classroom teachers and building principals generally lacked these advantages, and therefore were less successful. University professors, though sometimes strikingly successful when substantial federal funding was available for large workshops, were less effective in providing day-to-day leadership and follow-up with individual teachers, although they retained the potential for transcending local boundaries.

The fit between USMES decision-making processes and the decision-making processes of the local educational agency had a critical influence on the number of participants the teams could train. When most USMES decision-making processes were carried out at the level of classroom teacher and building principal, the team had difficulty obtaining enough funding to support either extensive training activities or satisfactory follow-up programs. When some of the USMES decision-making activities were carried out at or above the level of curriculum specialist, implementation and training activities could proceed most freely. In some states, the issue of whether a state mandate had been secured was a major determining factor on the success of USMES.

Personnel and financial support by the USMES central staff seems to have had a positive effect on the training activities of certain teams. This support, though it was *not* helpful in promoting the growth and survival of the team, yielded good results for two teams in this study (Teams 4 and 8), both in terms of the number of individuals trained and the rate of USMES use among trainees.

Where USMES was introduced as a vehicle for staff development or student-attitude improvement, training was effective throughout the target population; outside this population, little training took place. On the other hand, where USMES was introduced to complement an existing program, training activities have taken place on a relatively grand scale, utilizing delivery systems already in existence and a preselected target population. Teams designed to function in this "symbiotic" manner probably mounted more effective training efforts than teams formed for other reasons.

Some teams, by developing USMES programs that explicitly incorporated other materials or furthered local practical ends, increased the size of their potential audiences and increased their power to attract local funds.

The teams differed sharply in the strategies they adopted for promoting USMES. Some teams tried to attract outside funding to carry out large-scale training activities; some followed a demonstration-school strategy, building a powerful and effective example of successful USMES at a single school to convince other schools or districts to adopt the program; some teams tried explicitly to make USMES attractive to a particular district or system, correlating USMES with local philosophies and recognized curriculum areas; some began by creating new resource teams. The strategy of seeking outside funding was more successful early in the project. Subsequently it has not worked so well, though it is still effective in some cases and provides a major source of support for one team in the study. The demonstration-school strategy, though it led to strong teams whose members were good USMES teachers, was usually ineffective as a means for spreading USMES. This was probably because the stronger the demonstration school is, the more rivalry it arouses in neighboring schools, and the more strongly it seems to argue *against* the need for general district-level funding of USMES. Attempting to "sell" a district through curriculum correlation and other techniques, and training new resource teams directly, are generally quite effective strategies.

Findings: Use of USMES by Team-Trained Teachers

In general, the quality of workshop training afforded to participants by the 15 teams was good. Among teachers trained by the resource teams, 62.5 percent tried USMES with their classes. Of this group, the mean number of challenges conducted by 1 January 1977 was 3.6.

One issue of considerable interest is how much various parts of the USMES curriculum are used by team-trained teachers in the field. Figures derived for this study show that How-To Cards (preliminary editions) are least popular (58.1 percent of teachers having access to these cards use them). Resource books are most popular (84.3 percent), and Design Lab materials are at an intermediate level (71.9 percent). Further, it was reported that all 24 units prepared by the USMES development staff were used in the field; frequencies of use did not vary excessively.

The degree to which team-trained teachers followed the recommendations of program developers in conducting USMES classes was investigated. It was found that team-trained teachers were following the recommendations of developers on number-of-students involved, use of discussions, session length, and number of sessions per week. The duration, in weeks, of a typical challenge in the field (at a mean of 4.9 weeks per challenge) was a little shorter than that contemplated by the project developers (6-8 weeks).

Another issue of concern is how well the philosophical values of the project are transmitted from developers to teachers through the resource team program. To answer this question, teachers and developers alike were asked to assess the importance of 18 values selected by the investigators. A positive

correlation was found to exist between the values selected by team-trained teachers and those selected by central staff members. Analyses of variance performed for each of the 18 values showed no significant variation (at the .05 level) in the importance attached to these values by teachers trained among the 15 teams. Thus, it appears that the philosophical values of the program were transmitted in a uniform manner by resource teams.

Appendices

FORMAT USED FOR RESOURCE TEAM DOSSIERS

USMES TEAM STUDY: SITE VISIT TO *(name of team)*

TEAM STRUCTURE

(Our records show that the following people have been involved with the team in some way. Please check the accuracy of the information presented for each person, filling in any missing data that you can, and then describe their current relationship to the team--active member, nonmember but part of support system, nonmember and no longer involved with USMES, etc.)

Name	Role	Institution (If school, ist district also)	USMES Training	Currently Active Member? (If no, please comment)

DISSEMINATION AND IMPLEMENTATION ACTIVITIES

(Our files contain the following information on informational meetings and workshops conducted by the team. Please correct any errors and fill in any information that you can.)

INFORMATIONAL MEETINGS

Date	Participants Numbers/Roles/Institutions	Location	Presenter(s)	Purpose/Agenda/Activities/ Units	Costs/Funding (including donated space, materials, services)

WORKSHOPS

Date	Participants Numbers/Roles/Institutions	Location	Presenter(s)	Purpose/Agenda/Activities/ Units	Costs/Funding (including donated space, materials, services)

A2

USMES TEAM STUDY: INTERVIEW WITH _____

DATE _____

1. TEAM STRUCTURE: PRESENT/PAST/FUTURE

- What is the present structure of the team? What people and institutions are included and why.

- Have there been changes in the team structure over time? If yes, what are they and why did they occur?

- How was the team formed? When? By whom? For what reasons? Who was included and why?

- Do you anticipate any changes in structure in the future? If yes, what changes do you foresee and why?

2. TEAM GOALS: PRESENT/PAST/FUTURE

- What are the present goals of the team? Why were these goals chosen? What are your goals in terms of informing people about USMES? In terms of training teachers to do USMES? What other goals do you have?

- Have there been changes in goals over time? If yes, what are they and why did they occur?

- What were the goals at the time the team was formed? Why were those goals chosen? (If possible, refer to team implementation plan submitted at workshop. Was there consensus on this plan?)

- Do you anticipate any changes in goals in the future? If yes, what changes do you foresee and why?

3. TEAM STRATEGIES: PRESENT/PAST/FUTURE

- What are your strategies for meeting the present goals? Why were those strategies chosen? (e.g., meetings, workshops, brochures, news articles, use of consultants...)

- Have there been changes in strategies over time? If yes, what are they and why did they occur?

- What were your original strategies? Why were those strategies chosen? (If possible, refer to team implementation plan.)

- Do you anticipate changes in strategies in the future? If yes, what changes do you foresee and why? What are your future plans?

4. SUPPORTS AND CONSTRAINTS: HUMAN AND FINANCIAL

- What kinds of help have you received in disseminating and implementing USMES? Where has the support come from? (e.g., local, state, or federal grants; funds from district or school budgets; release time, substitutes, or inservice days; donation of space or materials for meetings or workshops; assistance in preparing, printing, or mailing information pieces; salary or college credits for workshop participation...)

- What obstacles have existed?

- Have the kinds of supports and constraints changed over time? If yes, how have they changed and why?

- Is there anything particular about the local or regional situation that has helped? (e.g., educational needs in local districts or schools; goals and values of local administrators, teachers, and parents...)

SUPPORTS AND CONSTRAINTS continued on next page

4. SUPPORTS AND CONSTRAINTS (continued)

- What about USMES as a curriculum makes it hard or easy to disseminate and implement it? How well do you think USMES meets the needs of students, teachers, school systems in your area?

- How have you tried to capitalize on the support and minimize the obstacles? What future plans do you have? Are there any external supports (e.g., federal programs) that you would like to encourage in the future?

5. EFFECTIVENESS

- Given all this, how effective do you think you've been in meeting the team goals? How effective do you think you've been in disseminating and implementing USMES?

- What is your assessment of the quality of USMES done by teachers you've trained?

6. EFFECTS

- What changes have you observed as a result of the USMES team activities? (e.g., in yourself, in the people you've worked with or trained--administrators, college personnel, teachers, parents--and in students)

- How have you evaluated the teacher training the team has done?

- Have there been any local evaluations of student learning in USMES? If yes, what has been done and what were the results?

7. PERSONAL SATISFACTION

- What has the USMES team experience been like for you? What kinds of personal satisfaction or frustration have you experienced?

USMES TEAM STUDY: SITE VISIT TO _____

TEAM QUESTIONNAIRE

The following items relate to your perceptions about the team. Please indicate how much you agree or disagree with each statement.

	Strongly Agree	Mildly Agree	Can't Decide	Mildly Disagree	Strongly Disagree
1. The team's dissemination and implementation goals are unrealistic.	___	___	___	___	___
2. The resource team is an appropriate mechanism for disseminating and implementing USMES.	___	___	___	___	___
3. There is adequate communication among team members.	___	___	___	___	___
4. There is adequate communication between the team and other school personnel.	___	___	___	___	___
5. The team isn't able to change its dissemination and implementation strategies to meet the needs of the district(s).	___	___	___	___	___
6. The team effectively utilizes the strengths of the members to achieve its goals.	___	___	___	___	___
7. The team members don't enjoy working together.	___	___	___	___	___
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities.	___	___	___	___	___
9. The team effectively utilizes the district resources to disseminate and implement USMES.	___	___	___	___	___
10. The team will cease to function next year.	___	___	___	___	___
11. The team feels that the USMES approach to teaching and learning is important.	___	___	___	___	___
12. The team members derive personal satisfaction from being part of the team.	___	___	___	___	___

COMMENTS (You may use the back if you wish.)

USMES TEAM STUDY: _____

DECISION-MAKING MATRIX

This decision-making matrix is presented in order to determine which groups play major roles in curriculum adoption and implementation in your school district(s).

Please check appropriate boxes:	USMES									OTHER CURRICULUM PROGRAM								
Governing Processes / Prime Movers	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher	Parents				School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher	Parents			
DETERMINING GOALS (establishing or recognizing ultimate objectives):																		
PLANNING (setting forth means to accomplish objectives):																		
PROGRAMMING (determining specific activities):																		
DEVELOPING AND ALLOCATING RESOURCES (financial and human resources necessary):																		
IMPLEMENTING (carrying out objectives):																		
EVALUATING (appraising what is done):																		

A10

All

edc **unified sciences and mathematics for elementary schools**

MATHEMATICS AND NATURAL, SOCIAL, AND COMMUNICATIONS SCIENCES IN REAL PROBLEM SOLVING

January 25, 1977

Dear Colleague:

As the USMES program nears the end of its development period, we are looking at the results of different teacher training methods used with USMES. To do this, we are working with the people in USMES's "resource teams" who have given workshops in many parts of the country.

Our records show that you attended an USMES workshop or course conducted by members of your local resource team. (Please let us know if we're wrong! Part A of this questionnaire covers that.)

Your views are important to us. We hope you can spare a few minutes to answer some questions. The information which you provide should help improve the teacher training components of many curriculum programs. Even if you have had little or no experience with USMES since the workshop, please answer as many of the questions as possible and return the questionnaire to us.

Of course, your responses to the questions will be kept strictly confidential; we will only report anonymous summary results. (The code numbers will only be used to send follow-up questionnaires to those who do not respond to the initial request.)

Please try to return the questionnaire within a week.

Your cooperation is greatly appreciated.

Sincerely,

USMES Research Staff

P.S. We really wish we could visit your school and talk with you personally. We would be particularly interested in hearing about USMES units you and your students have done and would be delighted to receive any information you can send us about your USMES experiences.

EDUCATION DEVELOPMENT CENTER
55 CHAPEL STREET
NEWTON, MASSACHUSETTS 02160
TELEPHONE 617 969-7100

A

1. Did you actually attend an USMES training workshop or course? (If not, please skip the remaining questions and send the questionnaire back.)

2. To the best of your memory, when and where did the workshop or course take place?

3. When you attended the workshop or course, what were your plans for using USMES? Had you already decided to use USMES?

   Were you just looking for information about USMES?

4. Did the workshop or course provide you with what you wanted in the way of training?

   In the way of information?

5. From your point of view, what were the most important things that you learned about USMES at the workshop or course?

B

1. Have you ever used USMES with your students? (If not, will you tell us what factors in the USMES program or in your local teaching situation contributed to your decision not to use it? Then skip the remaining questions and send the questionnaire back.)

2. Please indicate which USMES units you have used this year, last year, and before last year.

UNIT USED...	THIS YEAR	LAST YEAR	BEFORE
Advertising			
Bicycle Transportation			
Classroom Design			
Classroom Management			
Consumer Research			
Describing People			
Designing for Human Proportions			
Dice Design			
Getting There			
Growing Plants			
Lunch Lines			
Manufacturing			
Mass Communications			
Nature Trails			

UNIT USED...	THIS YEAR	LAST YEAR	BEFORE
Orientation			
Pedestrian Crossings			
Play Area Design And Use			
Protecting Property			
School Supplies			
School Zoo			
Soft Drink Design			
Traffic Flow			
Ways to Learn/Teach			
Weather Predictions			
LOCALLY DEVELOPED UNITS:			
_____			
_____			
_____			

3. When you use USMES, how long is an average session (in minutes or hours)?

   How many sessions are there per week, on the average?

   How many weeks does the unit typically last?

4. In a typical USMES session, how many students are actively involved?

   What is the total number of students in the class, on the average?

5. Please describe how discussions usually take place in an USMES session: Do they take place in small groups? With the class as a whole?

   Are discussions usually at the beginning of the class? In the middle? At the end?

   Are the discussions usually student-run? Teacher-run?

C

1. Do you have access to USMES Teacher Resource Books?

   Design Lab tools and materials?

   "How To" cards?

2. Do you make use of the Teacher Resource Books, if they are available?

   Do you or your students make use of the Design Lab tools and materials, if available?

   Do you or your students make use of the "How To" cards, if available?

D

1. What grade level do you teach?

2. How is your use of USMES influenced by your local teaching situation, your educational goals, and your teaching style?

E

Over the years that USMES has been under development, teachers and students have demonstrated that certain aspects of the program are important no matter how a particular unit unfolds. The degree of importance varies, though, depending on the teacher, the students, and the situation.

Below is a list of important aspects of USMES. We would like to survey teachers' reactions to the different items. In terms of your goals and teaching style, which <u>five</u> aspects are <u>most</u> important to you? Please put a check next to each of the five items you choose.

_____ a. Problem arises naturally from an event or discussion.

_____ b. Problem is a real concern to the students.

_____ c. Problem is complex enough to have no "right" solutions and to require in-depth investigations.

_____ d. Problem situation really can be improved as a result of the students' work.

_____ e. Students make plans and decisions about how to proceed--what to do, who will do it, how it will be done.

_____ f. Students work in small groups on different tasks.

_____ g. Students regularly discuss progress--what they have accomplished and what remains to be done.

_____ h. Students apply math and science skills and concepts.

_____ i. Students apply language arts and social science skills and concepts.

_____ j. Students use tools and building materials.

_____ k. Students interact with one another in productive, cooperative ways.

_____ l. Students take responsibility for improving the problem situation.

_____ m. Students arrive at a solution to the problem and the unit comes to a natural conclusion.

_____ n. Student work is careful and thorough, not superficial or haphazard.

_____ o. Student work relates to solving the problem.

_____ p. Teacher allows students to make mistakes and helps them to learn from their errors.

_____ q. Teacher provides redirection when necessary, steps in to get students refocused on the problem and the investigation.

_____ r. Teacher teaches skills in a meaningful context.

Comments?

A15

edc unified sciences and mathematics for elementary schools

MATHEMATICS AND NATURAL, SOCIAL, AND COMMUNICATIONS SCIENCES IN REAL PROBLEM SOLVING

March 21, 1977

Dear Colleague:

Several weeks ago we sent you a questionnaire about your use of USMES. According to our records, we haven't heard from you yet. (If you have responded already we apologize; please disregard this letter.)

If you have not responded, PLEASE FILL OUT THE SHORT QUESTIONNAIRE ON THE BACK INSTEAD. We urgently need your responses to these few key questions. It will only take 2-3 minutes to respond and a return envelope is enclosed.

Your assistance is greatly appreciated. It will make this study of teacher training methods much more useful.

Sincerely,

USMES Research Staff

EDUCATION DEVELOPMENT CENTER
55 CHAPEL STREET
NEWTON, MASSACHUSETTS 02160
TELEPHONE 617 969-7100

1. Did you actually attend an USMES training workshop or course? (If not, please skip the remaining questions and send the questionnaire back.)

2. To the best of your memory, when and where did the workshop or course take place?

3. Did the workshop or course provide you with what you wanted in the way of training?

   In the way of information?

4. Have you ever used USMES with your students? (If not, will you tell us what factors in the USMES program or in your local teaching situation contributed to your decision not to use it? Then skip the remaining questions and send the questionnaire back.)

5. Please indicate which USMES units you have used this year, last year, and before last year.

UNIT USED....	THIS YEAR	LAST YEAR	BE-FORE
Advertising			
Bicycle Transportation			
Classroom Design			
Classroom Management			
Consumer Research			
Describing People			
Designing for Human Proportions			
Dice Design			
Getting There			
Growing Plants			
Lunch Lines			
Manufacturing			
Mass Communications			
Nature Trails			
Orientation			
Pedestrian Crossings			
Play Area Design And Use			
Protecting Property			
School Supplies			
School Zoo			
Soft Drink Design			
Traffic Flow			
Ways to Learn/Teach			
Weather Predictions			
LOCALLY DEVELOPED UNITS:			
_____			
_____			
_____			

6. What grade level do you teach?

7. How is your use of USMES influenced by your local teaching situation, your educational goals, and your teaching style?

SUMMARY OF IMPLEMENTATION ACTIVITIES, ALL TEAMS

TM	TRND	TM AGE	I	@I	W	@W	@I/YR	@W/YR	@I/MEM	@W/MEM	@I/MEM-YR	@W/MEM-YR
1	19	19	9	271	13	433	171.	273.	14.	23.	9.0	14.4
2	5	32	9	293	5	136	110.	51.	59.	27.	22.0	10.2
3	9	34	57	912	3	157	322.	55.	101.	17.	35.8	6.2
4	21	41	24	879	5	158	257.	46.	42.	8.	12.3	2.2
5	4	20	19	243	1	8	146.	5.	61.	2.	36.4	1.2
6		16	6	81	2	59	61.	44.				
7	9	29	3	57	2	110	24.	46.	6.	12.	2.6	5.1
8	51	43	25	608	18	445	170.	124.	12.	9.	3.3	2.4
9	16	39	18	940	2	92	289.	28.	59.	6.	18.1	1.8
10	5	18	7	102	3	11	68.	7.	20.	2.	13.6	1.5
11	6	18	10	431	2	57	287.	38.	72.	10.	47.9	6.3
12	5	17	6	149	1	29	105.	20.	30.	6.	21.0	4.1
13	4	39	4	113	4	105	35.	32.	28.	26.	8.7	8.1
14	7	17	14	234	3	96	165.	68.	33.	14.	23.6	9.7
15	11	18	12	268	2	55	179.	37.	24.	5.	16.2	3.3
MEAN	12.	27.	15.	372.	4.	130.	159.	58.	40.	12.	19.	5.
s	12.	10.	14.	312.	5.	134.	95.	66.	27.	8.	13.	4.
TOT:	172	$\bar{x}$=27.	223	5581	66	1951	2389	867.	32.	11.	14.	5.

TRND = The number of individuals trained at USMES Central (National) workshops //
TM AGE= Age of the team in months // I=Informationals given // @I=Individuals (tot) at Informationals //
W= Workshops given // @W=Individuals (tot) at Workshops//
@I/YR= Number of people reached in informational meetings per year //
@W/YR= Number of peopled reached in workshops per year //
@I/MEM=Number of people reached in informationals per national-workshop-trained team member//
@W/MEM=Number of people reached in workshops per national-workshop-trained team member //
@I/MEM-YR=@I/MEM per year ... "annual return on investment" in terms of people reached in informationals //
@W/MEM-YR=@W/MEM per year ... "annual return on investment" in terms of people reached in workshops //

TEAM QUESTIONNAIRE

COMPOSITE FOR ALL TEAMS IN THE STUDY

	Strongly Agree	Mildly Agree	Can't Decide	Mildly Disagree	Strongly Disagree	
1. The team's dissemination and implementation goals are unrealistic.	2	3	3	28	39	N=75
2. The resource team is an appropriate mechanism for disseminating and implementing USMES.	55	25	1	5	1	N=87
3. There is adequate communication among team members.	33	32	3	14	6	N=88
4. There is adequate communication between the team and other school personnel.	15	30	13	21	9	N=88
5. The team isn't able to change its dissemination and implementation strategies to meet the needs of the district(s).	2	7	11	31	29	N=80
6. The team effectively utilizes the strengths of the members to achieve its goals.	40	28	1	13	4	N=86
7. The team members don't enjoy working together.	1	3	2	16	66	N=88
8. The team is able to cope with unanticipated problems with minimum disturbance to team activities.	34	34	10	7	3	N=88
9. The team effectively utilizes the district resources to disseminate and implement USMES.	21	40	7	10	2	N=80
10. The team will cease to function next year.	1	3	17	14	45	N=80
11. The team feels that the USMES approach to teaching and learning is important.	67	14	2	1	2	N=86
12. The team members derive personal satisfaction from being part of the team.	54	24	4	1	1	N=84
	325	243	74	161	207	

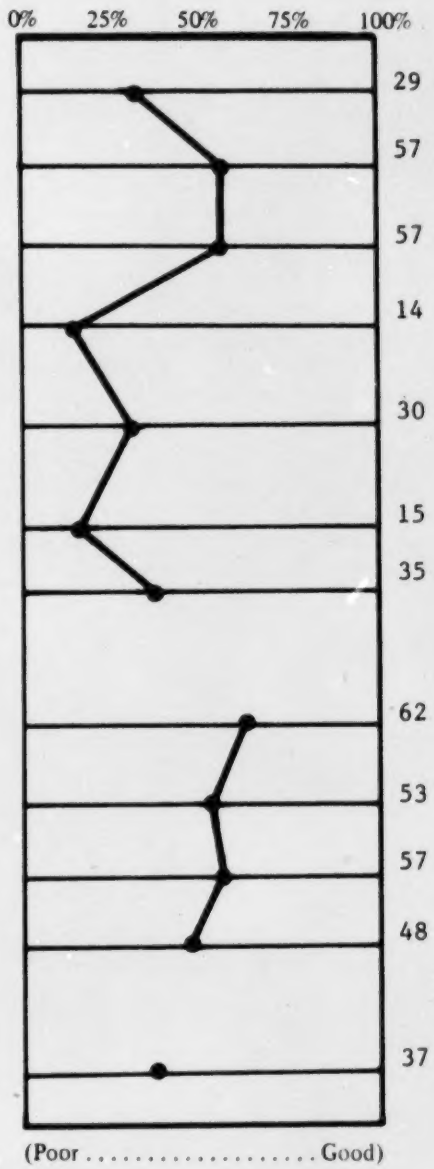
PERCENTILE TABULATIONS OF RESPONSES

TO TEAM QUESTIONNAIRE

Median response displays of results from the team questionnaire, such as appear following team narratives in Part 2, are here supplemented by displays showing the percentile position of team median responses in relation to all individual responses in the study. This type of display has certain advantages. The scores center around a midpoint on the display for all questions (even those that were answered quite positively by most teams) so that the relative positiveness or negativeness of a particular team on a certain point can be assessed. The percentiles are computed from a base of all individuals queried, so that the relative positiveness of response cannot be distorted by, for example, a team of three individuals answering "strongly disagree" to question 12, thus making all other teams look too good by comparison (since they would all fall within the upper part of the range of response so defined.)

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 1



TEAM AND ENVIRONMENT

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THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 2

TEAM AND ENVIRONMENT

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THE USMES PROGRAM

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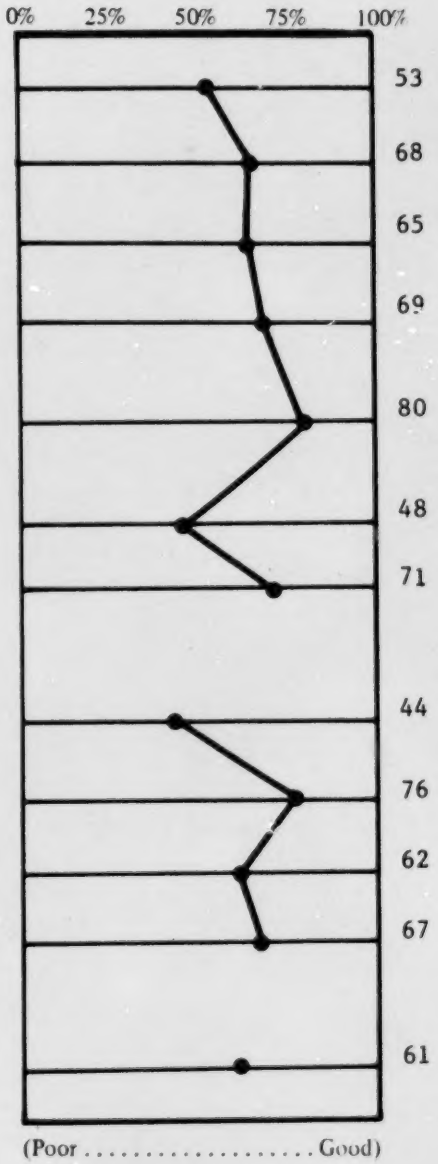
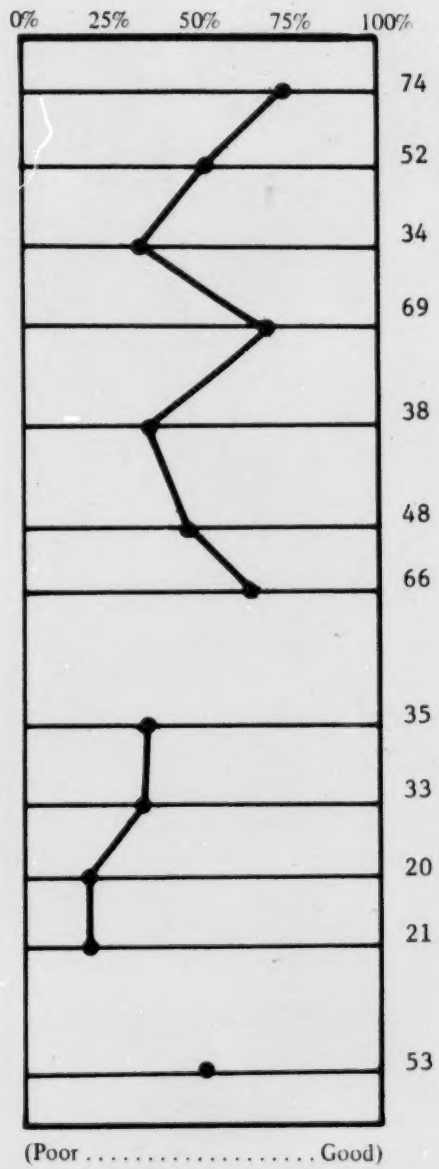


TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 3



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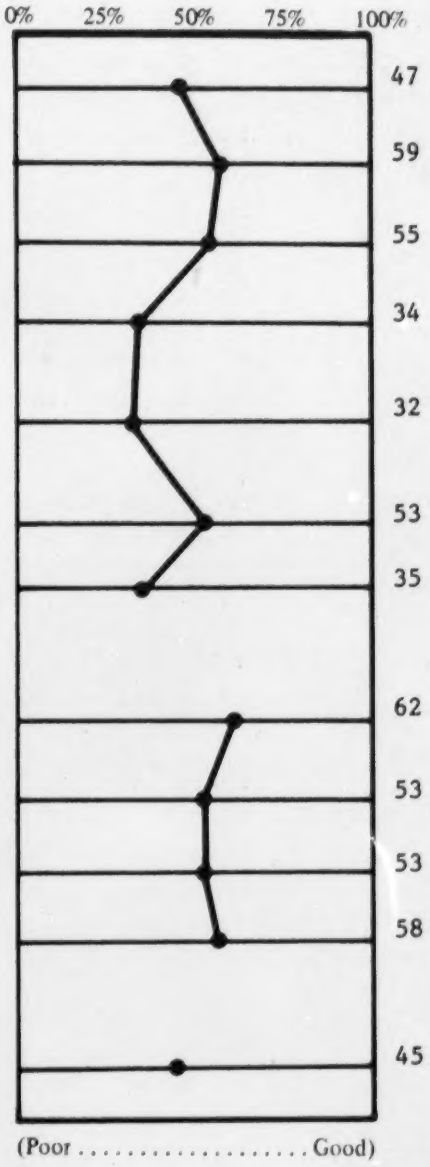
THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 4



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THE USMES PROGRAM

11. The team feels that the USMES approach to teaching and learning is important

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 5

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THE USMES PROGRAM

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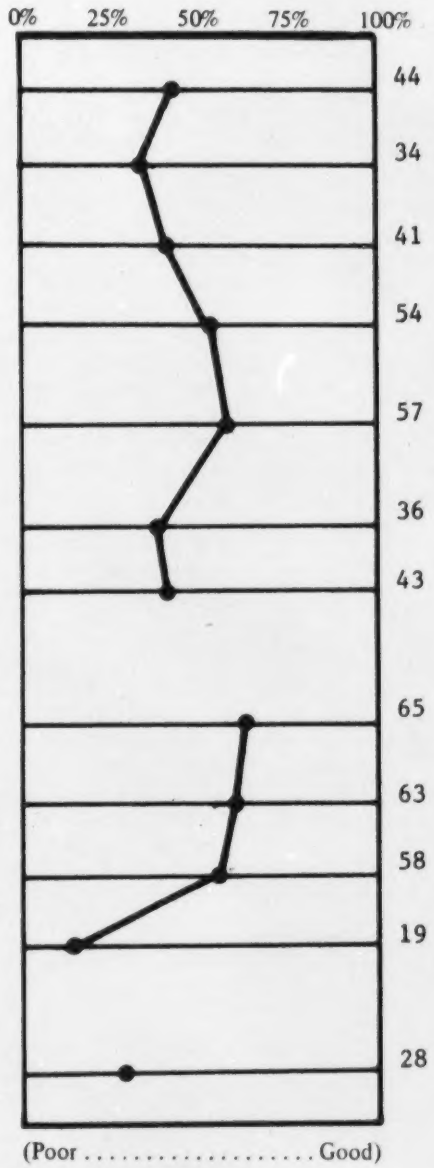

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 7

TEAM AND ENVIRONMENT

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THE USMES PROGRAM

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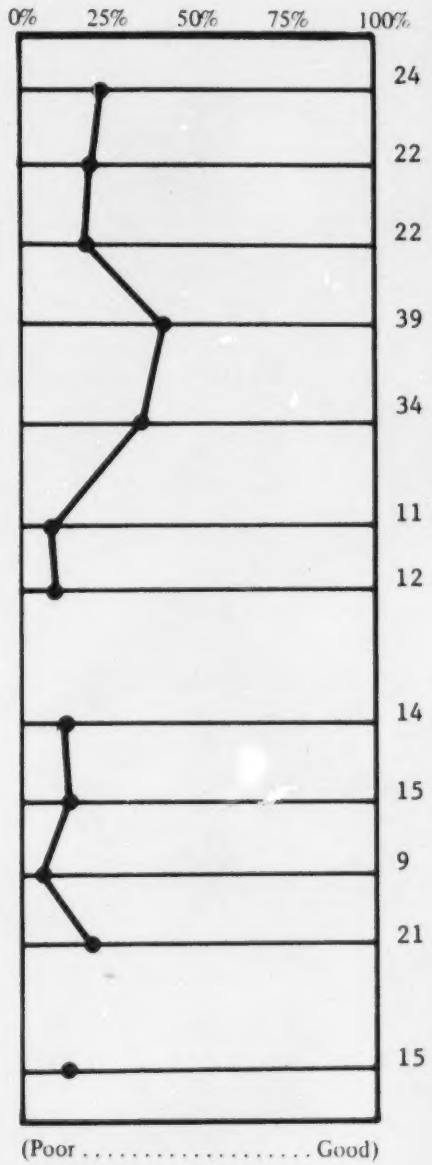

TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 8

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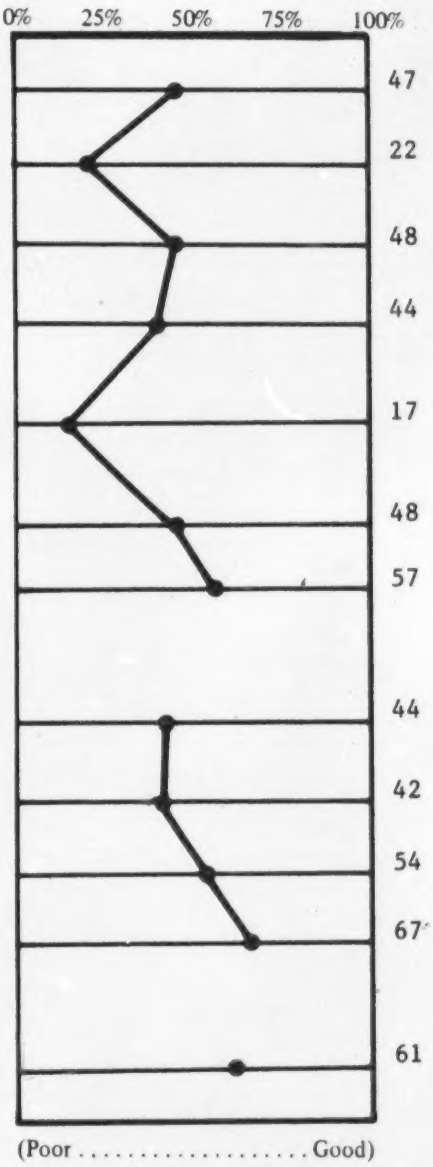
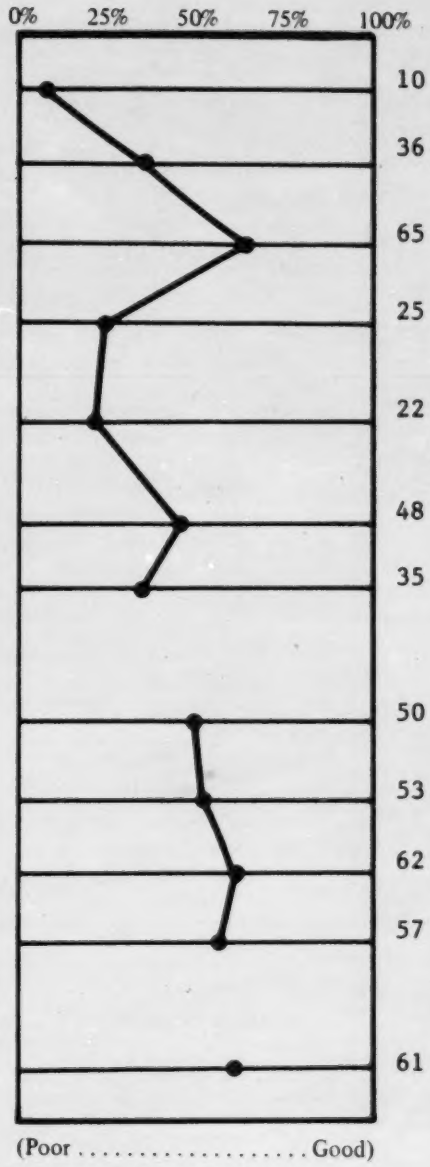


TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 9



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TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 10

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THE USMES PROGRAM

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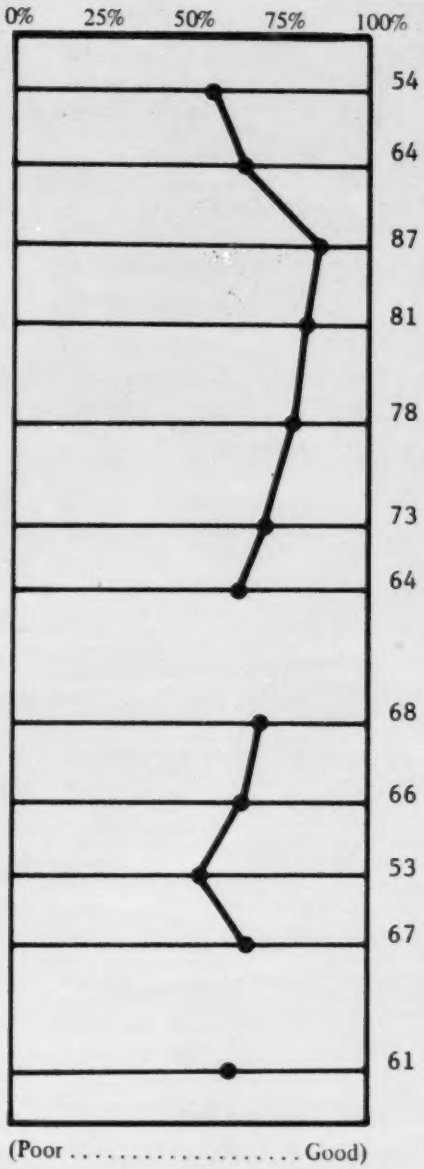
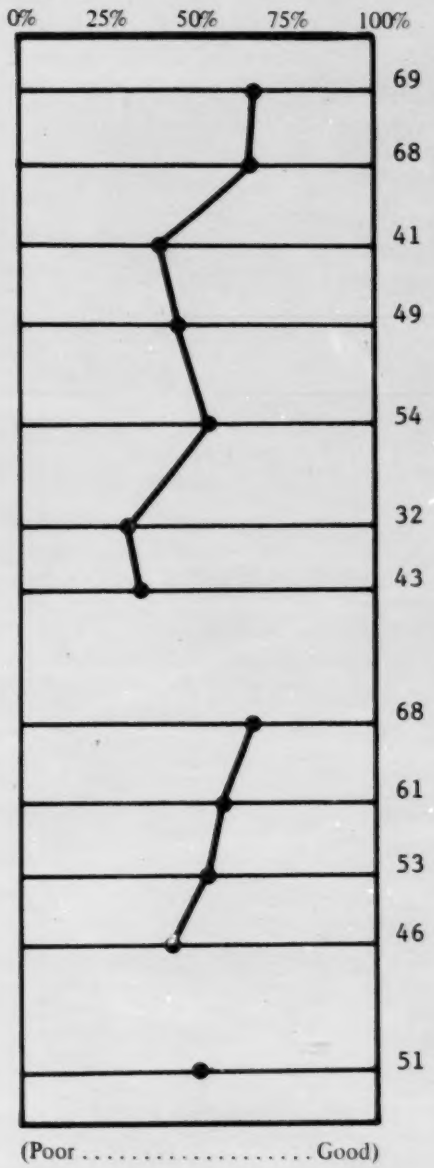


TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 11



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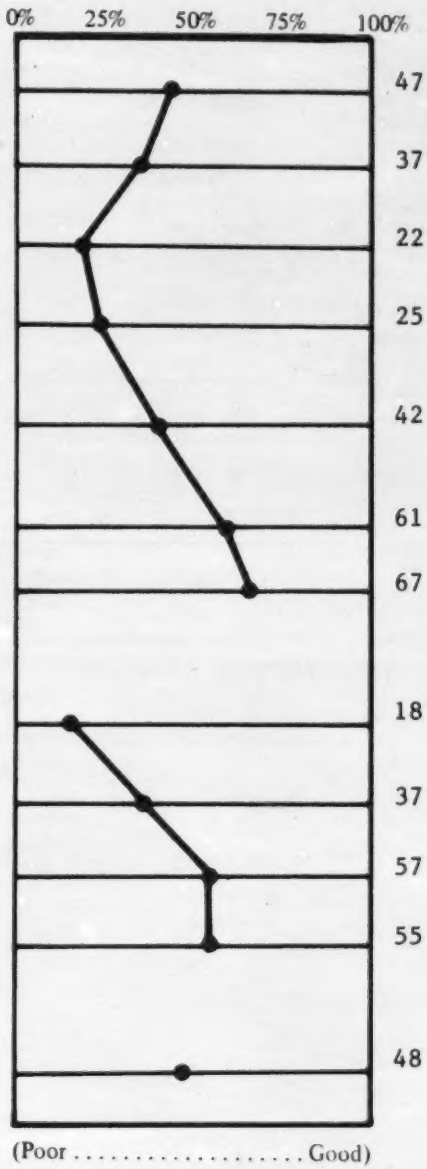
TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 12



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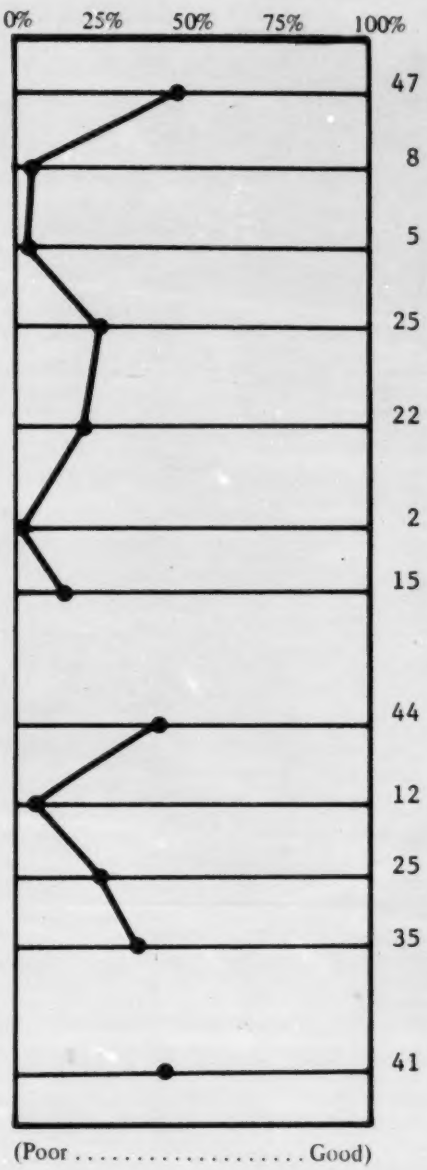
TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 13



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TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 14

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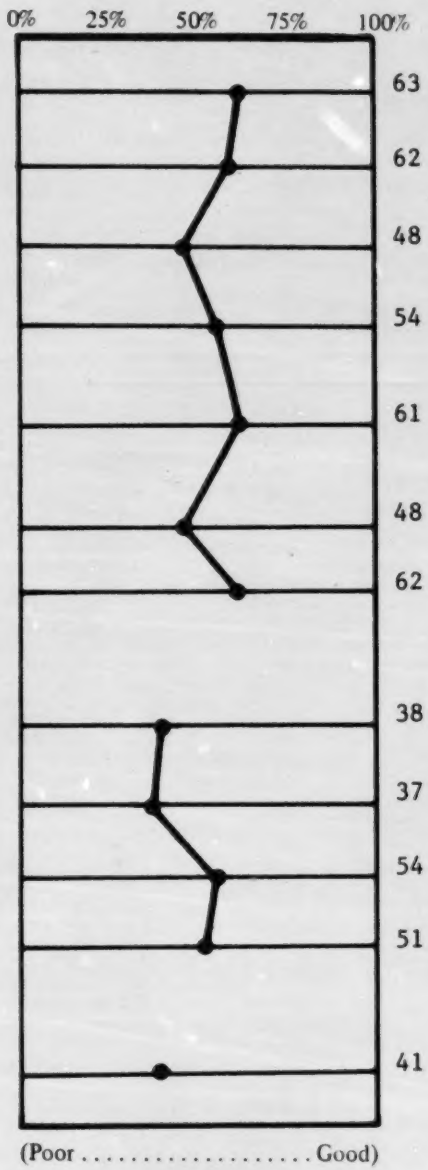
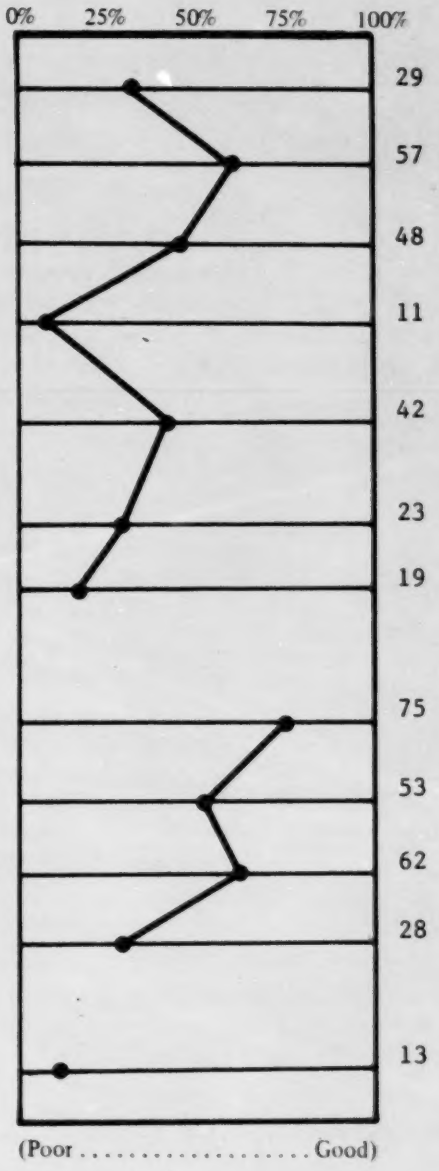


TEAM QUESTIONNAIRE: Percent of total sample less favorable than team median

TEAM # 15



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DECISION-MAKING MATRICES: ALL TEAMS

Following are:

- A decision-making matrix for each team except Teams 1 and 6, filled out by team members.
- The composite decision-making matrix for all 15 teams.

TEAM 2

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				X	O	
PLANNING *(setting forth means to accomplish objectives)*				XO		
PROGRAMMING *(determining specific activities)*				X		O
ALLOCATING RESOURCES *(financial and human resources necessary)*				XO		
IMPLEMENTING *(carrying out objectives)*				X		O
EVALUATING *(appraising what is done)*			O			X

TEAM 3
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*			O	X		
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*			O			X
ALLOCATING RESOURCES *(financial and human resources necessary)*		O	X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*		O				X

TEAM 4
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				O		X
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*					O	X

TEAM 5
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				O		X
PLANNING *(setting forth means to accomplish objectives)*		O				X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*		O	X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*					O	X

TEAM 7
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				XO		
PLANNING *(setting forth means to accomplish objectives)*				XO		
PROGRAMMING *(determining specific activities)*				O		X
ALLOCATING RESOURCES *(financial and human resources necessary)*		O		X		
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*				O		X

TEAM 8
DECISION–MAKING MATRIX

X = USMES
O = Other Succesful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	O					X
PLANNING *(setting forth means to accomplish objectives)*					O	X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*	O				X	
IMPLEMENTING *(carrying out objectives)*				O		X
EVALUATING *(appraising what is done)*	O					X

TEAM 9
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	O					X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*						X
ALLOCATING RESOURCES *(financial and human resources necessary)*	O		X			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*	O					X

TEAM 10
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*			O			X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*			O			X
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*				O		X
EVALUATING *(appraising what is done)*			O			X

TEAM 11
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*		O				X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*		O				X
ALLOCATING RESOURCES *(financial and human resources necessary)*		X	O			
IMPLEMENTING *(carrying out objectives)*				O		X
EVALUATING *(appraising what is done)*			O			X

TEAM 12

DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*				O		X
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*			O			X

TEAM 13
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	Science Committee	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	O					X
PLANNING *(setting forth means to accomplish objectives)*	O					X
PROGRAMMING *(determining specific activities)*	O					X
ALLOCATING RESOURCES *(financial and human resources necessary)*			XO			
IMPLEMENTING *(carrying out objectives)*	O					X
EVALUATING *(appraising what is done)*	O					X

TEAM 14
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*						XO
PLANNING *(setting forth means to accomplish objectives)*				O		X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			XO			
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*			O		X	

TEAM 15
DECISION–MAKING MATRIX

X = USMES
O = Other Successful Program in the area

PRIME MOVERS:

GOVERNING PROCESS:	State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*			O			X
PLANNING *(setting forth means to accomplish objectives)*			O			X
PROGRAMMING *(determining specific activities)*						XO
ALLOCATING RESOURCES *(financial and human resources necessary)*			O		X	
IMPLEMENTING *(carrying out objectives)*						XO
EVALUATING *(appraising what is done)*				O		X

COMPOSITE DECISION-MAKING MATRIX FOR THE TEAMS OF THE STUDY

(Data Not Available for Teams 1 and 6)

DECISION-MAKING MATRIX

USMES / Other Program	PRIME MOVERS: State Legislature	School Board	Central Administration	Curriculum Specialist	Building Principal	Classroom Teacher
GOVERNING PROCESS:						
DETERMINING GOALS *(establishing or recognizing ultimate objectives)*	0 / 2	0 / 1	0 / 3	3 / 4	0 / 1	10 / 1
PLANNING *(setting forth means to accomplish objectives)*	0 / 0	0 / 1	0 / 4	1 / 6	0 / 1	10 / 0
PROGRAMMING *(determining specific activities)*	0 / 0	0 / 1	0 / 2	1 / 1	0 / 0	12 / 7
ALLOCATING RESOURCES *(financial and human resources necessary)*	0 / 2	1 / 3	5 / 7	2 / 1	5 / 0	0 / 0
IMPLEMENTING *(carrying out objectives)*	0 / 0	0 / 0	0 / 0	1 / 3	0 / 0	12 / 9
EVALUATING *(appraising what is done)*	0 / 2	0 / 0	0 / 6	0 / 2	1 / 2	12 / 0

Note: Some teams specified prime movers not included in the list of possibilities presented to them. In general, such teams were asked to specify second choices, and it is these second choices which are given here. The sole exception to this rule is the choice, "State Legislature," which is included here.

The option "Parents," which was one of those presented, was not selected by any team.

SAMPLING CONSIDERATION AND THE QUESTIONNAIRE FOR TEAM-TRAINED TEACHERS

The questionnaire for team-trained teachers (QT3) was initially mailed, in the long form reproduced on page A10, to all team-trained teachers in the study for whom names and addresses were available. The response to this initial mailing is shown in the following table.

Response to Initial Mailing of Questionnaire (Long Form)

Number Mailed	*Responses*	*Undeliverable*	*Estimated Number Mailed to Valid Addresses*	*Estimated Response Rate*
1,147	196	81	1,066	18.4%

This initial mailing did not furnish a satisfactory sample for our use, for the following reasons.

- The total number of responses, 196, yields a rather small *n* for making comparisons among 15 teams.
- These 196 responses represent only a small fraction of the population being addressed. It can be argued that this small sample, far from being random with respect to the total population, is strongly selective in favor of respondents who were positive towards USMES. This might result from psychological causes (people with positive comments are more likely to respond), or might reflect a supposition among addressees who have not used USMES that they have "nothing to report."

Therefore, certain follow-up procedures where initiated. A random sample of 330 individuals was selected from the 870 who had, presumably, received

but not returned a questionnaire in the first mailing. This random sampling was carried out team wide--that is, 25 individuals were selected from the teachers trained by each team, except where fewer than 25 names were available.

QT3 Team-wide Random Sampling

Team	*Number Selected*
5	6*
10	10*
12	14*
all others	25 each

**Total number of names available from team.*

Total population = 870

Total sample = 330

The 330 individuals selected were then sent further queries. A shortened form of the questionnaire was employed and was mailed up to three times to elicit the largest possible response. The intent was to collect a sample of *non*respondents to compare to the initial group of respondents, to see whether statistically significant differences existed between these two groups.

The following table summarizes the result of all four mailings (the initial mailing and three iterations of the subsequent smaller one.

QT3 Mailings

Mailing	*Form*	*Number Mailed*	*Responses*	*Undeliverable*	*Remainder*
1	Long	1147	196	81	870
2	Short	330*	96	5	229
3	Short	228**	80	4	144
4	Short	144	25	8	111

**Based on a random sample of 330 individuals taken from 870 individuals who did not respond to mailing 1.*

*** Not equal to "remainder" from mailing 2, because of one late return from mailing 1.*

A number of addressees whose questionnaires were not returned as "undeliverable" in the initial mailing did have their questionnaires returned in one of the subsequent mailings. Presumably, two separate factors were at work:

- Throughout the mailings, postal authorities and new tenants returned only a certain percentage of those items intended for relocated addressees.
- Some addressees moved while our mailings were in progress.

Neither explanation is sufficient by itself. If a fixed probability of return for all undeliverables were operative, we would have expected to receive about 1 return (rather than 4) on the third mailing, and none (rather than 8) on the last; likewise, if relocation were the sole operative factor, we would be obliged to accept the unlikely fact that more than 35 percent of all addressees who moved since participating in workshops moved during the two-month period of our survey.

Accordingly, we have estimated undeliverables at an intermediate level--a level that neither assumes relocation in the course of the study nor failure to report any undeliverables after the first mailing. A summary of the two stages of the survey, and the response elicited by each is given below.

Summary of Mailings

Form	Number Mailed	Estimated Number Mailed to Valid Address	Response	Response Rate
Long	1147	1021	196	19.2%
Short	330	313	201	64.2

The table indicates a response rate of 19.2 percent for the first mailing, and 64.2 percent for the set of three follow-up mailings.

Furnished with an initial sample and a follow-up sample, it is possible to compare the two by statistical means, and thus to estimate how representative the original group of 196 (who answered the first mailing) are of the population from which they selected themselves.

On three issues, differences were found to be nonsignificant:

Opinions about Training			*T-Test (Pooled Variance Estimate)*		
Group	*Individuals Responding*	*Respondents Who Thought Workshop Provided Enough Training*	*T Value*	*DF*	*2-TAIL Prob.*
Original Mailing	136	87.5%	0.35	241	.729
Follow-up Mailings	107	86.0			

Implementation after Training			*T-Test (Pooled Variance Estimate)*		
Group	*Individuals Responding*	*Respondents Who Reported Doing USMES With Their Students*	*T Value*	*DF*	*2-TAIL Prob.*
Original Mailing	120	69.2%	-0.28	221	.783
Follow-up Mailings	103	70.9			

Opinions about Workshop Information			*T-Test (Pooled Variance Estimate)*		
Group	*Individuals Responding*	*Respondents Who Thought Workshop Provided Enough Information*	*T Value*	*DF*	*2-TAIL Prob.*
Original Mailing	126	94.4%	1.53	139.91	.129
Follow-up Mailings	85	88.2			

On the issue of whether respondents actually received USMES training, a significant difference was observed:

Respondents Trained			*T-Test (Pooled Variance Estimate)*		
Group	*Individuals Responding*	*Respondents Actually Trained*	*T Value*	*DF*	*2-TAIL Prob.*
Original Mailing	176	93.8%	5.26	282.04	.000
Follow-up Mailings	181	74..0%			

Since the issue of how many participants considered themselves trained in USMES is not central to this study, it seemed best to use as our sample just the 339 (out of a total of 397) individuals who *did not deny* having been trained.

Proceeding on this basis, we observe that the remaining two items that might be compared between the short and long forms of the QT3--the percent of respondents who gave evidence of performing one or more USMES challenges and the mean number of USMES units conducted--show very small, nonsignificant differences between the two groups:

Group	Total Group*	Respondents Giving Evidence of USMES Teaching	T-Test (Pooled Variance Estimate) T Value	DF	2-TAIL Prob.
Original Mailing	185	62.7%	0.07	337	.945
Follow-up Mailing	154	62.3			

**Based on total of 339 respondents who did not deny receiving USMES training.*

Group	Total Group*	Mean Number of Units Done	T-Test (Pooled Variance Estimate) T Value	DF	2-TAIL Prob.
Original Mailing	185	2.37	-0.04	337	.970
Follow-up Mailing	154	2.38			

**Based on total of 339 respondents who did not deny receiving USMES training*

At this point, it is probably justifiable to treat the original set of responses and the subsequent set as representative of the population from which they both were drawn, with the proviso: That these samples not be equated, nor treated as representative of that population, where the question of whether respondents actually received workshop USMES training is concerned. On the other hand, if one specifically excludes from consideration those individuals who deny having received training, it is probably possible to proceed with a strong assurance that a representative sample is being employed.

Thus, Section Four of this report, which reports the results of this questionnaire, actually bases its reports on the 185 original respondents and 154 later respondents who did not deny receiving USMES training.